# "TO STUDY THE SOCIODEMOGRAPHIC, MICROBIO-PATHOLOGICAL, CLINICO-RADIOLOGICAL PROFILE AND ETIOLOGY OF PATIENTS WITH NON-RESOLVING PNEUMONIA IN A TERTIARY CARE HOSPITAL"

**Dissertation submitted to The Tamil Nadu Dr.M.G.R. Medical University in partial fulfilment of the requirements for the degree of**

**Doctor of Medicine (M.D) in**
**Tuberculosis and Respiratory Diseases**
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**Institute of Thoracic Medicine,**
**Madras Medical College &**
**Rajiv Gandhi Government General Hospital**

**The Tamil Nadu Dr.M.G.R. Medical University**
**Chennai – 600032**
**Tamil Nadu**
**India**
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## BONAFIDE CERTIFICATE

This is to certify that the dissertation titled **"TO STUDY THE SOCIODEMOGRAPHIC, MICROBIO-PATHOLOGICAL, CLINICO-RADIOLOGICAL PROFILE AND ETIOLOGY OF PATIENTS WITH NON-RESOLVING PNEUMONIA IN A TERTIARY CARE HOSPITAL"** is the Bonafide work done by **Dr. SARAVANAVASAN R** during his **M.D (Tuberculosis and Respiratory Diseases)** course in the academic years 2013-2016, at the Institute of Thoracic Medicine and Rajiv Gandhi Government General Hospital – Madras Medical College, Chennai. This work has not previously formed the basis for the award of any degree.

**Prof. Dr. D. RANGANATHAN M.D., D.T.C.D., D.N.B**
Director, Institute of Thoracic Medicine,
Professor and Head, Department of Thoracic Medicine,
Rajiv Gandhi Government General Hospital and Madras Medical College,
Chennai.

**Prof. Dr. R. VIMALA M.D.,**
Dean,
Rajiv Gandhi Government General Hospital and Madras Medical College,
Chennai.

## DECLARATION BY THE GUIDE

This is to certify that the dissertation titled **"TO STUDY THE SOCIODEMOGRAPHIC, MICROBIO-PATHOLOGICAL, CLINICO-RADIOLOGICAL PROFILE AND ETIOLOGY OF PATIENTS WITH NON-RESOLVING PNEUMONIA IN A TERTIARY CARE HOSPITAL"** is the Bonafide work done by **Dr. SARAVANAVASAN R** during his **M.D (Tuberculosis and Respiratory Diseases)** course in the academic years 2013-2016, at the Institute of Thoracic Medicine and Rajiv Gandhi Government General Hospital – Madras Medical College, Chennai, **under my guidance**.

Signature of the Guide,

Name and Designation of the Guide:

**Prof. Dr. D. RANGANATHAN M.D., D.T.C.D., D.N.B**

Director, Institute of Thoracic Medicine,

Professor and Head, Department of Thoracic Medicine,

Rajiv Gandhi Government General Hospital and Madras Medical College,

Chennai.

**MADRAS MEDICAL COLLEGE & RAJIV GANDHI GOVERNMENT GENERAL HOSPITAL, CHENNAI – 600 003**

## DECLARATION BY THE SCHOLAR

I hereby declare that the dissertation titled **"TO STUDY THE SOCIODEMOGRAPHIC, MICROBIO-PATHOLOGICAL, CLINICO-RADIOLOGICAL PROFILE AND ETIOLOGY OF PATIENTS WITH NON-RESOLVING PNEUMONIA IN A TERTIARY CARE HOSPITAL"** submitted for the degree of **Doctor of Medicine (M.D) in Tuberculosis and Respiratory Diseases, Branch XVII** is my original work and the dissertation has not formed the basis for the award of any degree, diploma, associate ship, fellowship or other similar titles.

Place : Chennai — Signature of the scholar

Date : — Dr. SARAVANAVASAN R

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# CONTENTS

# ABSTRACT


## TITLE:

To study the sociodemographic, microbio-pathological, clinico-radiological profile and etiology of patients with non-resolving pneumonia in a tertiary care hospital.

## AIMS & OBJECTIVES:

- To study the

  SOCIODEMOGRAPHIC PROFILE

  CLINICO-RADIOLOGICAL PROFILE and

  MICROBIO-PATHOLOGICAL ETIOLOGY

  of patients admitted with Non-resolving pneumonia in a Tertiary care hospital.

- To study the co morbidities associated with non-resolving pneumonia.
- To study the usefulness/diagnostic yield of bronchoscopy in non-resolving pneumonia.
- To study the usefulness of Bronchial wash gene-xpert in diagnosing tuberculosis in non-resolving pneumonia.
- To compare Bronchial wash gene-xpert Vs. Bronchial wash AFB (Acid Fast Bacilli) smear in diagnosing tuberculosis in non-resolving pneumonia.

- To compare Bronchial wash gene-xpert Vs. Post bronchoscopy sputum AFB smear in diagnosing tuberculosis in non-resolving pneumonia.

## CASE DEFINITION:

"Non-resolving pneumonia is defined as a clinical condition wherein there is radiological infiltrates (focal or diffuse, unilateral or bilateral, parenchymal or interstitial) begin with clinical association of acute pulmonary infection and with a minimum 10 days of standard antimicrobial therapy, patients either fail to improve or worsen, or radiological opacities fail to resolve by 50% at 2 weeks or less than complete clearing at 4 weeks."

## MATERIALS/METHODS:

A total of 420 patients were admitted with provisional diagnosis of pneumonia during the study period. Out of them 55 patients (13%) diagnosed to have non-resolving pneumonia were evaluated. Sociodemographic data, detailed history, clinical examination, routine investigations, chest skiagram, CT chest and other relevant investigations were done. Bronchoscopy (FOB) and bronchial wash was done in all patients and sent for gene-xpert and other microbio-pathological investigations. Post bronchoscopy sputum was sent for AFB smear and cytology. Endobronchial biopsy, Trans Bronchial Lung Biopsy (TBLB), CT guided biopsy as necessary were done in selected patients.

## RESULTS:

Out of 55 patients, 80% (n=44) were males, 20% (n=11) were females. 78.2% (n=43) patients were more than 40 years. The most common presenting symptom was persistent cough with expectoration in 54.5% (n=30) patients, followed by dyspnea in 16.4% (n=9) patients. Chest pain followed by hemoptysis were the cardinal symptoms when cause for NRP is diagnosed as malignancy, (P-value 0.000). The average duration of symptom is 7.5 weeks and in cases diagnosed with tuberculosis it is 6.5 weeks (P-value 0.000). 47.3% were smokers and 54.5% patients had a history of chronic alcohol intake. Comorbidities were present in 82% (n=45) of patients. Among the patients with comorbidities, diabetes was present in 40%, COPD in 22.22%, renal failure in 6.67%, anemia in 6.67%, bronchial asthma in 4.44% and other comorbidities in 20%. 5 out of 10 patients (50%) with COPD were diagnosed with malignancy (P-value 0.000) and 50% of patients with diabetes were diagnosed with tuberculosis (P-value 0.024). Left upper lobe is most commonly involved, followed by right upper lobe and diffuse involvement. Bronchoscopy was diagnostic in 39/55 cases, the yield being 71%. Bronchial wash gene-xpert was positive (MTB DETECTED) in 23 patients (41.8%) and all patients had a result of Rifampicin resistance-Not detected. Bronchial wash AFB smear was positive in 12 out of 55 patients and Post FOB sputum AFB was positive in 4 out of 55 patients. Causes diagnosed were tuberculosis 41.8% (n=23), other bacterial pneumonia 14.5% (n=8), malignancy 12.7% (n=7), others 23.7% (n=13) and undiagnosed 7.3% (n=4).

## CONCLUSION :

- Non-resolving pneumonia was observed to be more common in patients >40 years of age which constitutes around 80% of study population.
- The most common presenting symptom was persistent cough with expectoration.
- Chest pain followed by hemoptysis were the presenting symptoms when cause for non-resolving pneumonia was diagnosed as malignancy.
- In our study smoking and alcoholism was found to be associated with non-resolving pneumonia in 47% patients and 55% patients respectively.
- Non resolving pneumonia was found to be associated with co morbidities in around 80% of our study population. Diabetes mellitus (40%) and COPD (22%) were the most common co morbidities. Non resolving pneumonia in diabetic patients is more likely to be tuberculosis with 50% of diabetics in our study were diagnosed with tuberculosis. Non resolving pneumonia in COPD patients, is an ominous sign, more chances of it being diagnosed as malignancy.
- Bronchoscopy was found to be a safe and useful procedure in non-resolving pneumonia patients and no serious complications were encountered. The diagnostic yield of bronchoscopy in our study was 71%.
- Tuberculosis was the most common cause for non-resolving pneumonia in around 42% of patients. Bacterial pneumonia (15%) and malignancy (15%) were the next two causes.
- Bronchial wash Gene Xpert, as a single investigation has a diagnostic yield of

around 42% in non-resolving pneumonia. Bronchial wash Gene Xpert has an additional yield of 48% in diagnosing tuberculosis against bronchial wash AFB smear. Bronchial wash Gene Xpert has an additional yield of 83% in diagnosing tuberculosis against Post Bronchoscopy sputum AFB smear. Our study suggests that Bronchial wash Gene Xpert can be included in the non-resolving pneumonia investigation panel, because it has a good diagnostic yield and provides an early diagnosis of tuberculosis before the patient becomes bronchial wash AFB or sputum AFB smear positive.

- Early bronchoscopy (after 2 weeks of antibiotics), is needed in non-resolving pneumonia for early diagnosis of tuberculosis.

# KEYWORDS

Non-resolving pneumonia

Co morbidities

Chronic Obstructive Pulmonary Disease (COPD)

Diabetes mellitus

Bronchoscopy

Bronchial wash Gene Xpert

Bronchial wash AFB smear

Post bronchoscopy sputum AFB smear

Tuberculosis

Malignancy

Bacterial pneumonia

# INTRODUCTION

Community-acquired pneumonia (CAP) is one among the many acute medical conditions that require hospitalisation.[1] Majority of patients hospitalised with community acquired pneumonia respond well to the standard antimicrobial therapy and follow an uncomplicated course but a minority or small proportion of patients fail to respond and require further investigations and treatment.[2 3] Even with the advances in clinical care, the mortality rate with community acquired pneumonia remains around five to fifteen percentage.[4 5] Patients with non-responding or progressive pneumonia represent a group of patients in whom early appropriate intervention can improve clinical outcome while preventing overtreatment.

Pulmonary physicians are often confronted with the dilemma of slowly resolving or non-resolving pulmonary radiological infiltrates for suspected community-acquired pneumonia (CAP) patients started on antibiotics. Non resolving pneumonia is estimated to be accountable for approximately fifteen percentage of inpatient admissions in the department of pulmonary medicine and eight percentage of bronchoscopies performed.[6] Slow resolution or non-resolution of pneumonia may in turn reflect inadequate antibiotic therapy, impaired defence of the host, resistance to antibiotics, or extremely virulent organisms, nonbacterial causes, endo-bronchial lesions which causes obstruction in the tracheo-bronchial tree (including neoplasms), and a series of non-infectious causes. Around 20 percentage of non-resolving pneumonia is due to non-infectious causes.[7]

Despite the frequency of non-resolving pneumonia there is very little studies/literature addressing this issue. Hence a better understanding of non-resolving pneumonia is the need of the hour for efficient management of this subset of patients.

# REVIEW OF LITERATURE

The terms slowly resolving pneumonia and non-resolving pneumonia are used interchangeably to refer to radiological abnormalities that are persistent beyond the expected period of time. The expected time period for resolution and the definition for non-resolving or slow resolving pneumonia however, is variably defined by many investigators.

As defined by Hendin[9] in 1975, "Slow/Non resolving pneumonia is persisting pulmonary consolidation more than 21 days."

As defined by Fein et al [10] in 1987, "Non-resolving/slow resolving pneumonia is a clinical condition wherein focal radiological infiltrates clearly begin with some clinical association of acute pulmonary infection such as fever, expectoration, malaise and dyspnea and fail to resolve in the expected period of time." The expected period of time for radiological resolution is in turn influenced by both the causative pathogen and the host factors.

Kirtland and Winterbauer[11] in 1991 defined slow/non-resolving pneumonia in immunocompetent patients based on radiological criteria. "It is defined as less than 50 percentage radiological resolution by 2 weeks or less than complete clearing by 4 weeks."

Fein and Feinsilver,[12] [13] [14] [15] later modified the non/slowly resolving pneumonia definition i.e. with an antibiotic therapy of minimum 10 days, the radiological infiltrates has not resolved in an expected time frame based on the presumed diagnosis.

The above criteria usually lack precision and are arbitrary. So, many questions usually arise regarding non/slowly resolving pneumonia.

What is the expected time frame for resolution? How long the treating doctor should wait for regression of radiological abnormalities before subjecting the patient to an exhaustive and expensive diagnostic work-up?

A majority of patients with community acquired pneumonia with typical features of cough with sputum production, fever and radiological infiltrates usually resolve with proper antibiotic therapy and an aggressive diagnostic workup is rarely needed.

But in a minority of patients, there is delay in radiological resolution which depends on lot of factors.[16 17 18] These include:

**AGE:**

Among patients, who are younger than 50 years of age, 90 percentage of them show radiological resolution by four weeks, whereas in patients over 50 years of age, it is only 30 percentage by four weeks even in the absence of associated co morbidities /medical illness.[14 15]

A study done by Jose Wellington Alves Dos Santos, et al[19] wherein pneumonia patients with non-infectious causes/infection with unusual pathogen that do not respond to usual antimicrobial treatment were evaluated. The average age was found to be 35.7 years and the range being 14-88 years.

In another study done by Zheng Wang, et al[20] in 232 cases of non-responding pneumonia, the average age of the population was 46 +/- 20 years.

A study done by B Jayaprakash, et al[21] to study the etiology and clinical outcome of non-resolving pneumonia, 84.6% patients were above the age of 40 years. Commonly affected age group was 51-60 years. Patients aged 50 years and more constituted 64.3% of the total study population.

A study on non-resolving pneumonia with special reference to role of fiber optic bronchoscopy done by Chaudhuri, et al[22] overall mean age of the patients was 51.33 ± 1.71 years (mean + SEM), and most of the patients (81%) were above the age of 40 years.

In another study done by Vipparthi Surya kumari, et al[23] Clinical and Etiological Profile of Unresolving Pneumonia Cases, the age group of the patients ranged from 14 – 73 years with a mean age of 48.3 ± 17.65 years.

A study done by Jain, et al[24] Role of fiber optic bronchoscopy and CT guided FNAC in diagnostic evaluation of Non-resolving Pneumonia involving sixty Five patients the mean age was 51 years.

**CO MORBIDITIES :**

With the presence of co morbidities there is usually delay in the resolution of pneumonia.

**Table 1: Co morbidities Associated With Non/Slow Resolving Pneumonia**

| CONDITION | EFFECTS |
|---|---|
| COPD | Cough Impairment and Defective Mucociliary Clearance |
| Alcoholism | Aspiration, Malnutrition, Neutrophil Function Impairment |
| Diabetes Mellitus | Impaired CMI (Cell Mediated Immunity) and Impaired Function of Neutrophils |
| CKD | Impaired Function of Macrophage and Neutrophil, Impaired Humoral Immunity, Hypocomplimentemia |
| Malignancy | Impaired Immunity, Chemotherapy Effects |
| Heart Failure | Pulmonary edema, Lymphatic Drainage Impairment |
| Neurological Illness | Aspiration, Defective Clearance of Secretions, Defective Cough |
| HIV | Impairment of Both Cell Mediated and Humoral Immunity |

A study done by Vipparthi Surya kumari, et al[23] Clinical and Etiological Profile of Unresolving Pneumonia cases, Diabetes mellitus (23.3%) was the most common co morbidity followed by, Chronic Obstructive Pulmonary Disease (20%), and Hypertension (16.6%).

Another study done by Jain, et al[24] Diagnostic evaluation of Non-resolving Pneumonia: Bronchoscopy and CT guided FNAC in 65 patients, the co morbidities associated with non-resolving pneumonia was Smoking in 25 patients (38.4%) which is statistically significant with a P-value of 0.039, Diabetes mellitus in 20 patients (30.7%) which is statistically significant with a

P-value of 0.01, Bronchiectasis in 16 patients (24.6%) which is statistically significant with a P-value of 0.045, Alcoholism in 17 patients (26.1%) which is statistically significant with a P-value of 0.044 and Hypertension in 12 patients (18.4%) with a P-value of 0.48. Diabetes had a significant correlation with infectious etiology than carcinoma (P value 0.01). Alcoholism had a significant correlation with infectious etiology than carcinoma (P value 0.044). Hypertension had no significant association with carcinoma or any other etiology (P value 0.48).

A study on non-resolving pneumonia with special reference to role of fiber optic bronchoscopy done by Chaudhuri, et al[22] in 60 patients, Diabetes mellitus was the commonest co morbidity and was noted in 20 patients (33.33%). Diabetes was significantly more associated with infective etiology, compared to malignancy (P = 0.023). Klebsiella pneumoniae was the most common organism isolated in patients with diabetes mellitus, in 6 out of 20 diabetics (30%), followed by Mycobacterium tuberculosis in 5 patients (25%) and Staphylococcus aureus in 4 patients (20%).

A study done by B Jayaprakash, et al[21] to study the etiology and clinical outcome of non-resolving pneumonia in 70 patients, Smoking was the most common co morbidity in 42 patients (60%) with a P-value of <0.05 followed by Alcohol abuse in 34 patients (48.6%) with a P-value of <0.05, Chronic Obstructive Pulmonary Disease in 25 patients (35.7%) with a P-value of <0.001, Hypertension in 15 patients (21.4%) with a P-value of <0.001, Diabetes in 32 patients (45.7%) with a P-value of <0.01, CAD in 13 patients

(18.6%) with a P-value of <0.001 and Immunosuppression in 5 patients (7.1%) with a P-value of <0.01. Smoking in 42 patients (60%) was the most common co morbidity noted. Alcohol abuse in 34 patients (48.6%), diabetes mellitus in 32 patients (45.7%), COPD in 25 patients (35.7%) and hypertension in 15 patients (21.4%) were the other statistically significant co morbidities.

## SEVERITY:

When comparing mild to moderate with severe pneumonia the estimated time period of resolution is 3-4 weeks and 10 weeks respectively.

## INFECTIOUS AGENT:

The rate at which clinical and radiological improvement occurs usually varies with the microorganism/infectious agent that is causing the pneumonia.[10]

**Table: 2 Radiological Resolution Among Different Infectious Agent**

| Infectious agent | Frequency of Transient radiological resolution | Time taken for full Radiological resolution | Prevalence of Residual radiological abnormalities |
|---|---|---|---|
| Staphylococcus Aureus | In A Majority Of Patients | 3-5 Months | Common |
| Streptococcus Pneumoniae (Non-Bacteremic) | Occasional | 1-3 Months | Rare |
| Streptococcus PneumoniaeWith Sepsis | In A Majority Of Patients | 3-5 Months | 25-35 Percentage |
| Legionella | In A Majority Of Patients | 2-6 Months | 25 Percentage |
| Gram Negative Bacteria | Occasional | 3-5 Months | 10-20 Percentage |
| HemophilusInfluenzae | Occasional | 1-5 Months | Occasional |
| Mycoplasma Pneumoniae | Rare | 2-4 Weeks | Rare |
| Chlamydia Species | Rare | 1-3 Months | 10-20 Percentage |
| Moraxella Catarrhalis | Rare | 1-3 Months | Unusual |

## MISDIAGNOSIS OF PATHOGENS:

Whenever there is failure of resolution to treatment with antibiotic therapy, one should consider the possibility of infection with alternative pathogenic microorganisms. These pathogenic microorganisms of concern include mycobacteria include Mycobacterium tuberculosis and NTM (non-tuberculous mycobacteria), Nocardia, Actinomyces and fungal pneumonia.

**TUBERCULOSIS** — Tuberculosis is of significant concern, because the way it presents as non-resolving pneumonia is atypical and it affects the elderly people with co morbidity, especially in diabetics and radiological areas involved are usually the mid and lower lung zones. Making a diagnosis in such cases is usually difficult because of the low sputum production and when mycobacterium tuberculosis culture is done it usually takes time before the result is available. Polymerase chain reaction (PCR) and gene xpert with sputum/bronchial wash specimens are useful in diagnosing tuberculosis.

**FUNGI** — Another pathogenic organism which can closely mimic bacterial pneumonia is fungi, which may be either opportunistic or endemic fungi. In patients presenting with non-resolving pneumonia one such fungi of particular concern is aspergillus, which can present as chronic necrotizing aspergillosis or invasive aspergillosis.

Patients with later stage of acquired immune deficiency syndrome (AIDS) are at higher risk of developing invasive aspergillosis.

Although invasive aspergillosis is classically seen in neutropenic patients, who are put on multiple antibiotics over a period of several days, it is on the rise and it is increasingly diagnosed in elderly patients particularly with chronic lung disease who are being put on long term corticosteroids. In this setting, aspergillus usually mimics a bacterial pneumonia, and one classic case series demonstrated that before the diagnosis of invasive aspergillosis was made, patients were treated with multiple antibiotics over an average period of 18 days.[25] Endemic fungal infections should be considered as a cause of non-resolving pneumonia when a patients present from an endemic area. The diagnosis include coccidioidomycosis, histoplasmosis, cryptococcosis and blastomycosis.[26]

**NOCARDIA AND ACTINOMYCES** —Though Actinomyces and Nocardia belong to higher order bacteria, infection by these organisms usually have a clinical presentation similar to that of a fungal etiology. Infection with Nocardia usually presents as a homogenous alveolar infiltrate which is localized, cavitary and non-segmental. Infection with Actinomyces usually has a similar appearance but has the capability to cross fissures and invade the chest wall.

## RESISTANT BACTERIAL PATHOGENS:

Whenever there is delay in the resolution of pneumonia/no appropriate response to the antibiotic therapy one should consider the possibility of infection with a resistant pathogen. Although Pneumococcus (streptococcus

pneumoniae) which is resistant to penicillin is of most concern, other multidrug resistant organisms such as Pseudomonas aeruginosa, Haemophilus influenzae and MRSA (Methicillin Resistant Staphylococcus Aureus) are being recognized increasingly as causes of non-resolving pneumonia in the community.

## DEVELOPMENT OF COMPLICATIONS FROM THE INITIAL PNEUMONIA:

When there is a focus of infection which is sequestrated it may prevent the antibiotics from reaching the infection site. Classical examples where there is sequestrated focus of infection which results in poor antibiotic penetration into the infectious site and delays the resolution of pneumonia are lung abscess and empyema.

## NON-INFECTIOUS ETIOLOGIES:

Around 20 percentage of patients presenting with community acquired pneumonia that is non-responding is due to non-infectious causes. A wide range of non-infectious etiology can cause a pulmonary infiltrate, which can present as pneumonia, which is non-resolving. These include the below categories namely

- Neoplastic,
- Inflammatory,
- Drug induced and
- Vascular Disease

**Table: 3 Non Infectious Etiologies Associated With Non/Slow Resolving Pneumonia**

| |
|---|
| **MALIGNANCIES** |
| Bronchogenic carcinoma |
| Bronchoalveolar cell carcinoma[27] |
| Lymphoma[28] |
| **IMMUNOLOGIC CONDITIONS** |
| BOOP (Bronchiolitis obliterans organizing pneumonia) |
| Vasculitis |
| Wegners granulomatosis (granulomatosis with polyangitis) |
| Diffuse alveolar haemorrhage |
| Sarcoidosis |
| Systemic lupus erythematosus |
| Acute interstitial pneumonia[29 30] |
| Eosinophilic pneumonias[31 32 33] |
| Acute eosinophilic pneumonia |
| Chronic eosinophilic pneumonia |
| Pulmonary alveolar proteinosis[34] |
| **DRUG INDUCED/TOXICITY**[35] |
| **PULMONARY VASCULAR ABNORMALITIES** |
| Heart failure |
| Pulmonary embolism |

There are only a few studies on non-resolving pneumonia which evaluated the various aspects of it and the factors associated with it and its etiology.

## SEX DISTRIBUTION IN NON-RESOLVING PNEUMONIA:

A study done by Vipparthi Surya kumari, et al[23] Clinical and Etiological Profile of Unresolving Pneumonia Cases, The incidence of Non-resolving pneumonia was more common in males (68.3%), when compared to females (33.3%).

A study on non-resolving pneumonia with special reference to role of fiber optic bronchoscopy done by Chaudhuri, et al[22] in 60 patients, 41 (68.3%) were males and 19 (31.7%) were females.

A study done by Jain, et al[24] Diagnostic evaluation of Non-resolving Pneumonia: Bronchoscopy and CT guided FNAC in Sixty Five patients the male:female ratio was 1:2.8 with 48 males (73.8%) and 17 females (26.1%).

A study done by B Jayaprakash, et al[21] to study the etiology and clinical outcome of non-resolving pneumonia in 70 patients, males were 48 (68.6%) and females were 22 (31.4%) with a male: female ratio 2.18:1

In another study done by Jose Wellington Alves Dos Santos, et al[19] 16 pneumonia patients with noninfectious causes/infection with unusual pathogen that do not respond to usual antimicrobial treatment were evaluated. Out of 16 patients 9 (56%) were males, and 7 (44%) were females.

## SYMPTOMS IN NON-RESOLVING PNEUMONIA:

A study done by B Jayaprakash, et al[21] to study the etiology and clinical outcome of non-resolving pneumonia in 70 patients, Cough (87.1%) and Fever (80%) were the most common symptoms.

A study on non-resolving pneumonia with special reference to role of fiber optic bronchoscopy done by Chaudhuri, et al[22] in 60 patients, the most common symptoms were cough (100%), followed by fever (96%), hemoptysis (53%), chest pain (38%), and breathlessness (33%).

A study done by Jain, et al[24] Diagnostic evaluation of Non-resolving Pneumonia: Bronchoscopy and CT guided FNAC in Sixty Five patients, the most common symptoms were Cough in 62 patients (95%), Fever in 55 patients (84.6%), Hemoptysis in 30 patients (46%), Chest pain in 28 patients (43%) and Shortness of breath in 20 patients (30.7%).

A study done by Vipparthi Surya kumari, et al[23] Clinical and Etiological Profile of Unresolving Pneumonia cases, the most common presenting symptoms were cough (100%) followed by dyspnea (70%), fever (56.6%), chest pain (30%) and hemoptysis (10%).

In another study done by Jose Wellington Alves Dos Santos, et al[19] 16 pneumonia patients with non-infectious causes/infection with unusual pathogen that do not respond to usual antimicrobial treatment were evaluated. The most common symptoms were cough (100%), fever (100%), and shortness of breath (69%). Out of the patients having cough as a symptom dry cough was present in 56.25% patients and productive cough in 43.75% patients.

## LOBES INVOLVED IN NON RESOLVING PNEUMONIA:

Jain, et al[24] Diagnostic evaluation of Non-resolving Pneumonia: Bronchoscopy and CT guided FNAC in 65 patients, the lobes involved were Right upper lobe in 23 patients (35%), Right lower lobe in 14 patients (21%), Left upper Lobe in 12 patients (18%), Multi lobar involvement in 8 patients (12.3%), Left lower Lobe in 6 patients (9.2%) and Right middle lobe in 2 patients (3%).

A study done by Vipparthi Surya kumari, et al[23] Clinical and Etiological Profile of Unresolving Pneumonia cases, Lobar pneumonia was seen in 80% of patients, bronchopneumonia in 20% of patients. Right lung lesions were found in 60% of patients, left lung in 36.6% patients and bilateral involvement was seen in 3.3% patients.

A study on non-resolving pneumonia with special reference to role of fiber optic bronchoscopy done by Chaudhuri, et al[22] in 60 patients, Right lung was involved in 39 (65%) patients, and Left Lung in 21 (35%) patients. The most commonly involved lobe was right upper lobe (25%), followed by right lower lobe (23%), left lower lobe (21%), and left upper lobe (15%). Bilateral and multilobar involvement were seen in 10 (16.67%) patients and were more common in tuberculosis and staphylococcal pneumonia (P = 0.0007).

A study done by B Jayaprakash, et al[21] to study the etiology and clinical outcome of non-resolving pneumonia in 70 patients, unilateral lung involvement was seen in 82.9% patients, with radiological lower zone involvement in 65.7%.

In another study done by Jose Wellington Alves Dos Santos,et al[19] 16 pneumonia patients with noninfectious causes/infection with unusual pathogen that do not respond to usual antimicrobial treatment were evaluated. The lobes involved were left upper lobe in 4 patients, bilateral involvement in 4 patients, lingular involvement in 3 patients, right lower lobe in 2 patients, left lower lobe in 2 patients and right upper lobe in 1 patient.

## SMOKING AND NON-RESOLVING PNEUMONIA:

Jain, et al[24] Diagnostic evaluation of Non-resolving Pneumonia: Bronchoscopy and CT guided FNAC in 65 patients, Smoking was found to have a more significant association with malignancy than infectious etiology group (p value 0.039).

A study done by Vipparthi Surya kumari, et al[23] Clinical and Etiological Profile of Unresolving Pneumonia cases, Smoking was the most common risk factor associated with Non-resolving pneumonia (66.6%)

A study on non-resolving pneumonia with special reference to role of fiber optic bronchoscopy done by Chaudhuri, et al[22] in 60 patients, 25 patients (41.6%) were smokers, and smoking was found to have a more distinct association with malignancy, compared to other etiological groups (P = 0.006). The most common co morbidity noted was smoking in 42 patients (60%).Out of the smokers 40% had a smoking index above 500.

## ETIOLOGY OF NON-RESOLVING PNEUMONIA:

A study done by Jose Wellington Alves Dos Santos, et al[19] wherein 180 patients admitted with community acquired pneumonia, 16 patients with noninfectious causes/infection with unusual pathogen that do not respond to usual antimicrobial treatment were evaluated. The Non-infectious etiology was Pulmonary embolism with pulmonary infarction in 2 cases, Wegner's granulomatosis, Bronchocentric granulomatosis, Hypersensitivity pneumonitis, Cryptogenic organizing pneumonia, Acute leukemia with pulmonary infarction and Pulmonary metastasis of gastric carcinoma in 1 patient each. Coming to the infection with unusual pathogenic organism the etiology diagnosed was Tuberculosis and Cryptococcosis in 2 patients each, Actinomycosis, Paracoccidioidomycosis and histoplasmosis in 1 patient each.

A study done by B Jayaprakash, et al[21] to study the etiology and clinical outcome of non-resolving pneumonia in 70 patients, the etiology was Tuberculosis in 11 patients (15.71%), Probable tuberculosis in 14 patients (20%), Malignancy in19 patients (27.1%), Bronchiectasis in 6 patients (8.6%), PCP in 5 patients (7.1%), BOOP in 4 patients (5.7%) ,Resistance to empirical antibiotics in 10 patients (14.3%) and others in 1 patient (1.4%).

A study on non-resolving pneumonia with special reference to role of fiber optic bronchoscopy done by Chaudhuri, et al[22] in 60 patients, the etiology diagnosed was Bacterial pneumonia in 32 patients (53.33%), Bronchogenic carcinoma in 16 patients (26.67%), Tuberculosis in 10 patients (16.67%),

Wegener's granulomatosis in 1 patient (1.67%) and Undiagnosed in 1 patient (1.67%).

In another study by Jain, et al[24] Diagnostic evaluation of Non-resolving Pneumonia: Bronchoscopy and CT guided FNAC in 65 patients, the etiology was Pyogenic infection in 24 patients (37%), Pulmonary tuberculosis in 19 patients (29.2%), Bronchogenic carcinoma in 15 patients (23%), Foreign body in 2 patients (3%), Segmental bronchial stenosis in 1 patient (3%), Multiple blood clots in 1 patient (1.5%), Wegners granulomatosis in 1 patient (1.5%) and Undiagnosed in 2 patients (3%).

A study done by Vipparthi Surya kumari, et al[23] Clinical and Etiological Profile of Unresolving Pneumonia cases, etiology diagnosed were Tuberculosis in 10 patients (33.3%), Malignancy in 9 patients (30.3%), Bacterial pneumonia unresponsive to empirical antibiotics in 5 patients (16.6%), Occult bronchiectasis in 2 patients (6.6%), Cryptogenic organizing pneumonia in 1 patient (3%), Pulmonary infarction in 1 patient (3%) and undiagnosed in 2 cases (6.6%).

With the above literature, our study was taken primarily to analyze the factors such as sociodemographic, clinico-radiological, microbio-pathological profile and etiology of non-resolving pneumonia and the usefulness of bronchoscopy and bronchial wash gene xpert.

# AIMS AND OBJECTIVES

## PRIMARY OBJECTIVES:

- To study the

  SOCIODEMOGRAPHIC PROFILE

  CLINICO-RADIOLOGICAL PROFILE

  MICROBIO-PATHOLOGICAL ETIOLOGY

  of patients admitted with Non-resolving pneumonia in a Tertiary care hospital.

## SECONDARY OBJECTIVES

- To study the co-morbidities associated with non-resolving pneumonia.
- To study the usefulness/diagnostic yield of bronchoscopy in non-resolving pneumonia.
- To study the usefulness of Bronchial wash gene-xpert in diagnosing tuberculosis in non-resolving pneumonia.
- To compare Bronchial wash gene-xpert Vs. Bronchial wash AFB (Acid Fast Bacilli) smear in diagnosing tuberculosis in non-resolving pneumonia.
- To compare Bronchial wash gene-xpert Vs. Post bronchoscopy sputum AFB smear in diagnosing tuberculosis in non-resolving pneumonia.

# MATERIALS AND METHODS

## SUBJECT SELECTION:

Patients admitted in Rajiv Gandhi Government General Hospital, with non-resolving pneumonia who meets the **case definition** as given below were selected.

**"Non-resolving pneumonia is defined as a clinical condition wherein there is radiological infiltrates (focal or diffuse, unilateral or bilateral, parenchymal or interstitial) begin with clinical association of acute pulmonary infection and with a minimum 10 days of standard antimicrobial therapy, patients either fail to improve or worsen, or radiological opacities fail to resolve by 50% at 2 weeks or less than complete clearing at 4 weeks."**[10, 11, 12, 13, 14, 15, 21, 22]

## INCLUSION CRITERIA:

- Patients admitted in department of thoracic medicine of both genders, diagnosed as cases of non-resolving pneumonia.
- Patients referred from other departments, diagnosed as cases of non-resolving pneumonia.

## EXCLUSION CRITERIA:

- Patients already diagnosed as
    - Sputum positive tuberculosis
    - Lung cancer

- Hospital acquired (HAP) and Ventilator associated (VAP) pneumonia

- Patients having very poor general condition, very severe breathlessness, recent history of myocardial infarction and patients not fit for bronchoscopy.

- Patients not willing to give informed written consent.

**STUDY CENTRE:**

The study was conducted in Rajiv Gandhi Government General Hospital, Park Town, Chennai, which is a tertiary care institute.

**STUDY DESIGN:**

- The study was a prospective observational study.
- Consecutive patients admitted with the diagnosis of Non-resolving pneumonia during the study period were included in the study.
- No specific method of randomization was used.
- No controls were used in the study.

**STUDY PERIOD:**

8 months, February 2015 – September 2015

**METHODOLOGY:**

A total of 420 patients were admitted with provisional diagnosis of pneumonia during the study period. Out of them, 55 patients (13%) who met

the case definition of non-resolving pneumonia, satisfying the inclusion and exclusion criteria and gave informed consent to participate were enrolled in the study.

1. Socio-demographic data of the patients such as
   - Age
   - Gender
   - Education of the patient and head of the household
   - Occupation of the patient and head of the household
   - Gross total income of the patient's family

   was collected.
2. Detailed clinical history of the patients was collected. The clinical history included
   - The presenting complaint/symptom for which the patient came to the hospital and the duration of the complaint/symptom and a detailed history of presenting illness.
   - The past history of the patient, whether he had any history of previous similar illness/any respiratory illness.
   - The treatment history, family history and occupational history.
   - The personal history of the patient including history of smoking and history of alcohol intake.
   - If smoking history is present it was quantified and the severity graded with smoking index.[36] Severity of smoking has traditionally been measured as smoking pack years. However it has not been

validated for quantifying other forms of tobacco use like bidis. Besides, the number of cigarettes in a pack varies indifferent brands. Since a considerable fraction of our study population used bidis, we used the tool Smoking Index instead of smoking pack years to quantify smoking.

Smoking index is calculated as the product of number of cigarettes or bidis smoked per day and the duration of smoking habit in years.

**Table 4: Severity of smoking based on Smoking Index**

| SMOKING INDEX | SEVERITY OF SMOKING |
|---|---|
| < 100 | Light smokers |
| 100 – 300 | Moderate smokers |
| > 300 | Heavy smokers |

Thus smoking index takes into account both the quantity and the chronic nature of the problem.

A person was considered to be a non-smoker if he or she has smoked less than 100 cigarettes or bidis in his/her lifetime.

- History of any Co morbidities such as
    - Diabetes mellitus
    - Chronic obstructive pulmonary disease (COPD)
    - Bronchial Asthma
    - Chronic kidney disease (CKD)/Renal Failure
    - Malignancy
    - Heart failure/Coronary artery disease
    - Hypertension
    - Neurological illness

3. General examination and a structured clinical examination of respiratory system and other systems were done.
4. Basic blood investigations of
    - Complete Blood Count
    - Renal Function Test
    - Liver Function Tests were done in all patients.
5. Chest skiagram (postero-anterior and lateral view) was taken at the time of inclusion into the study.

   Plain Computed Tomography(CT) chest (OR) Contrast enhanced CT chest (CECT) (OR) High Resolution Computed Tomography chest (HRCT) as demanded by the case scenario were done.
6. Other relevant investigations, necessary for diagnosis were done.
7. A careful pre-evaluation and cardiac fitness which includes an echo was done prior to Fiber optic bronchoscopy (FOB) in all patients.
8. As per BTS indication Fiber optic bronchoscopy (FOB) was done in all patients. Bronchoscopy (FOB) was done as per British Thoracic Society guideline for diagnostic flexible bronchoscopy in adults using Olympus fiber optic bronchoscope and strict disinfection protocol was followed for disinfecting the bronchoscope pre and post bronchoscopy as per the above mentioned guidelines.[37 38]

9. Bronchial washing from the involved lobe and the segment affected was done and the specimen obtained was sent for

    - Gene xpert[39] (CB-NAAT=cartridge based nucleic acid amplification test) which was being done at State Intermediate Reference Laboratory (IRL), Chetpet, Chennai.
    - AFB smear (Acid Fast Bacilli smear)
    - Non tuberculous bacterial culture
    - Cytology
    - Cell count
    - Fungal smear

10. During FOB

    - Endo bronchial biopsy
    - Trans bronchial lung biopsy if necessary were done.

11. Early morning samples were sent on first and second day post bronchoscopy for AFB smear examination.[40]
12. One early morning sputum sample was sent on first day Post bronchoscopy for cytology.[41]
13. CT guided biopsy if necessary was done in diagnosing the cause for non-resolving pneumonia.
14. The cause for Non-Resolving Pneumonia was diagnosed and the patient treated accordingly.

## STATISTICAL ANALYSIS:

Statistical analysis was done using the SPSS software. Significance of correlation between variables was assessed using P value. A correlation was considered to be statistically significant if its P value is less than 0.05.

# OBSERVATIONS AND RESULTS

## AGE DISTRIBUTION:

A total number of 55 patients who satisfied the inclusion and exclusion criteria were included in our study. The mean age of the total 55 patients was 49.3 years with a standard deviation of 12.5. The age of the patients ranged from 20 years-69 years. The percentage of the patients belonging to the 5 age groups namely <30 years, 31-40 years, 41-50 years, 51-60 years and >60 years were 10.9%, 10.9%, 23.6%, 38.2% and 16.4% respectively.

| AGE DISTRIBUTION (49.3 +/- 12.5) | | |
|---|---|---|
| | Freq. | % |
| < 30 years | 6 | 10.9 |
| 31 to 40 years | 6 | 10.9 |
| 41 to 50 years | 13 | 23.6 |
| 51 to 60 years | 21 | 38.2 |
| > 60 years | 9 | 16.4 |
| **Total** | **55** | **100** |

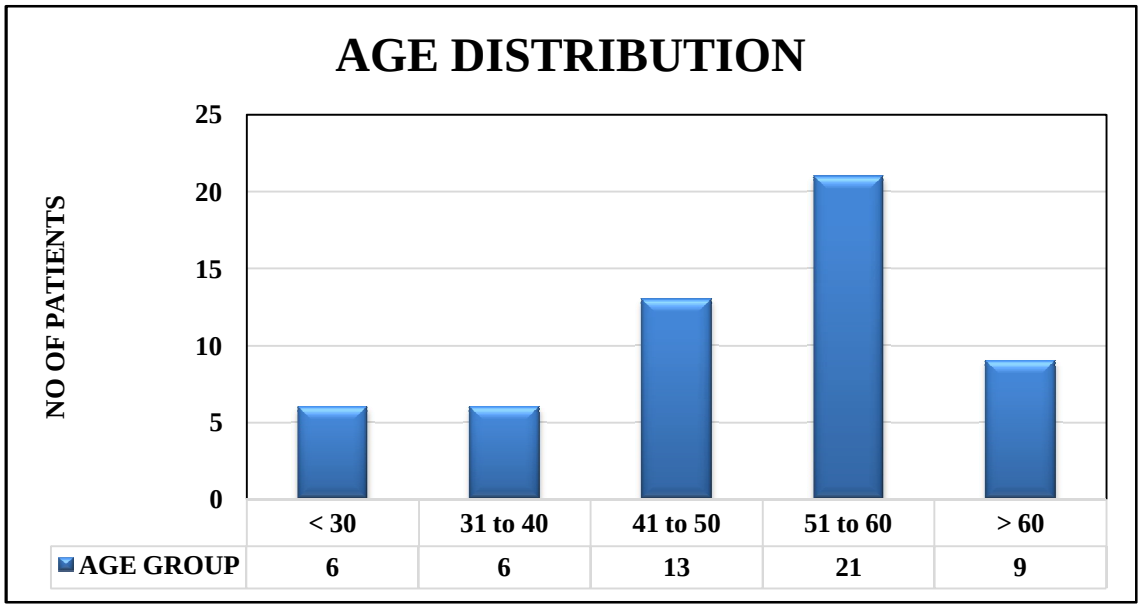



**Fig 1: Age Distribution**

## GENDER DISTRIBUTION:

Out of the total 55 patients, 44 patients were males and 11 patients were females. Thus males accounted for 80% of our study population while females accounted for 20%.

| GENDER DISTRIBUTION | | |
|---|---|---|
| | Freq. | % |
| Female | 11 | 20.0 |
| Male | 44 | 80.0 |
| **Total** | **55** | **100.0** |

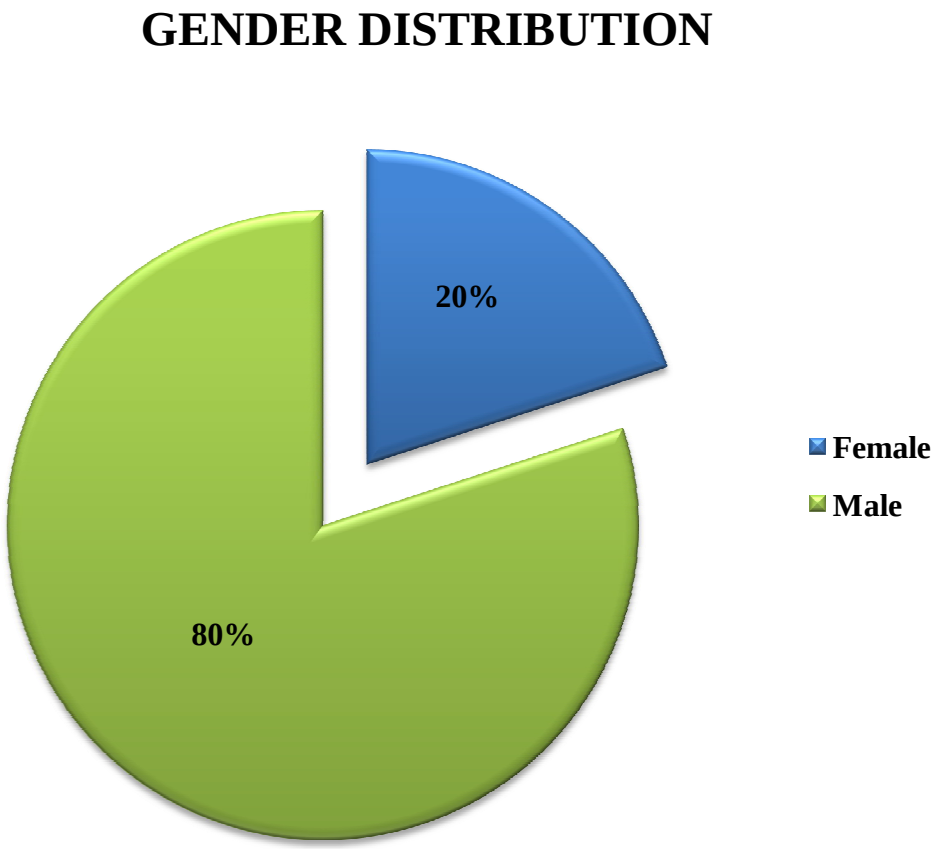



**Fig 2: Gender Distribution**

## PATIENT'S EDUCATIONAL STATUS:

In our study, out of 55 patients 49.1% were illiterate and 18.2% completed primary school, 10.9% completed middle school, 7.3% completed high school, 9.1% completed higher secondary school, 1.8% completed diploma and 3.6% completed post graduate diploma.

| PATIENT'S EDUCATIONAL STATUS | | |
|---|---|---|
| | Freq. | % |
| Illiterate | 27 | 49.1 |
| Primary School | 10 | 18.2 |
| Middle School | 6 | 10.9 |
| High School | 4 | 7.3 |
| Higher Sec. School | 5 | 9.1 |
| Diploma | 1 | 1.8 |
| Post Graduate Diploma | 2 | 3.6 |
| **Total** | **55** | **100.0** |

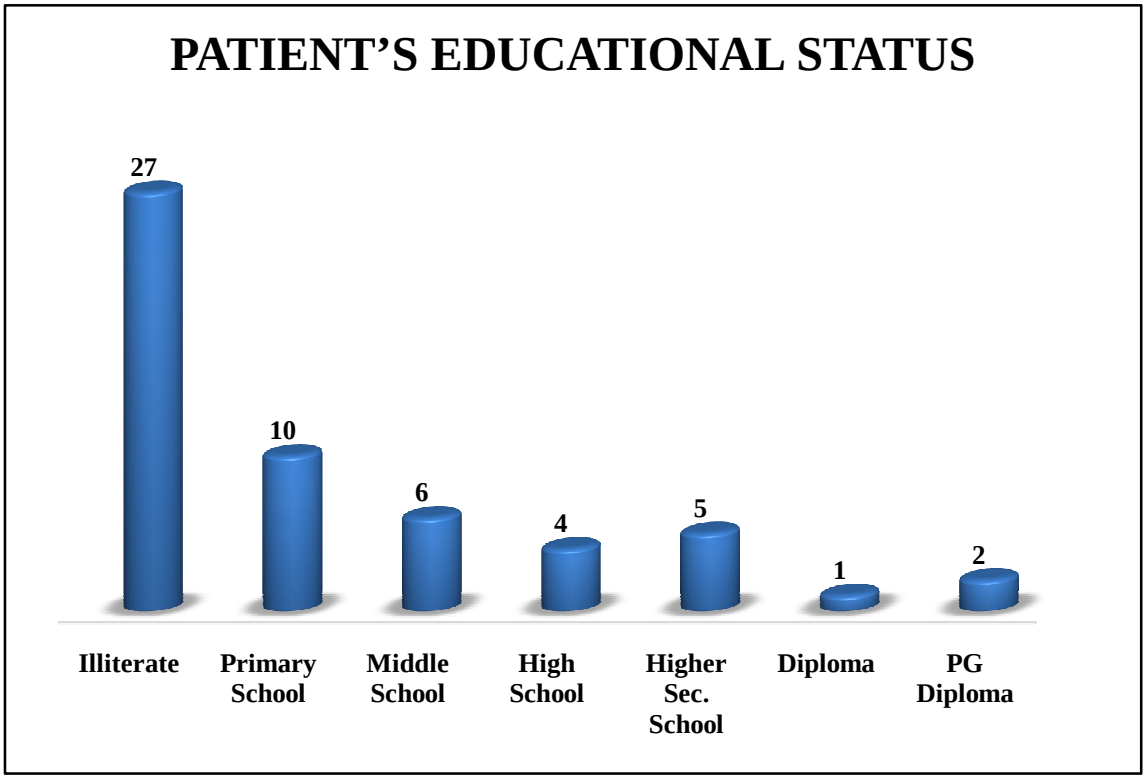



**Fig 3: Educational Status**

## GROSS TOTAL INCOME PER DAY:

The gross total income per day of the family in our study was less than or equal to 250 Rupees in 28 patients, 251-500 Rupees in 18 patients and 501-1000 Rupees in 9 patients.

| GROSS TOTAL INCOME PER DAY | | |
|---|---|---|
| | Freq. | % |
| ≤ 250 | 28 | 50.9 |
| 251 TO 500 | 18 | 32.7 |
| 501 TO 1000 | 9 | 16.4 |
| **Total** | **55** | **100.0** |

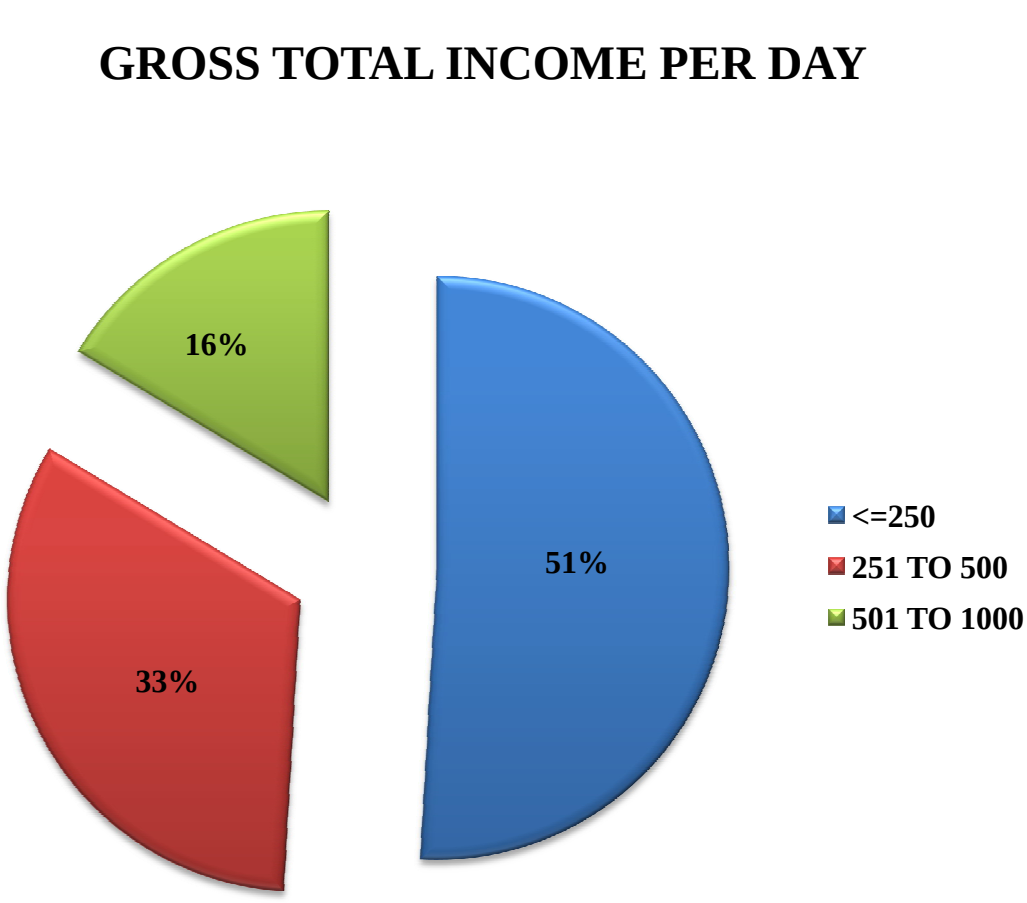



**Fig 4: Gross Total Income Per Day**

## PRESENTING SYMPTOMS:

The presenting symptom of the patients in our study was cough with expectoration in 54.5% of patients, dyspnea in 16.4%, hemoptysis in 10.9%, chest pain in 7.3%, dry cough in 5.5% and fever in 5.5%.

| SYMPTOMS | | |
|---|---|---|
| | Freq. | % |
| DRY COUGH | 3 | 5.5 |
| COUGH WITH EXPECTORATION | 30 | 54.5 |
| DYSPNEA | 9 | 16.4 |
| CHEST PAIN | 4 | 7.3 |
| HEMOPTYSIS | 6 | 10.9 |
| FEVER | 3 | 5.5 |
| **Total** | **55** | **100.0** |

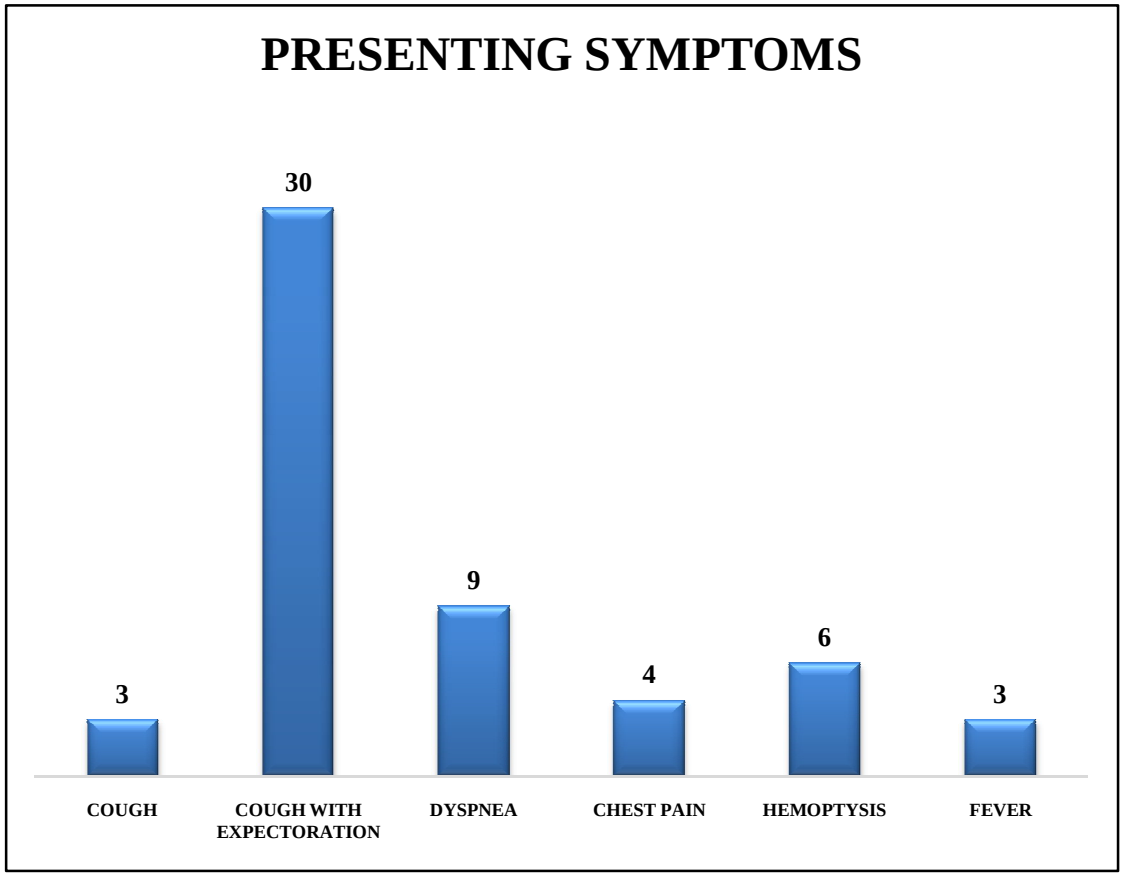



**Fig 5: Presenting Symptoms**

## DURATION OF SYMPTOMS:

The duration of symptoms in our study were divided into 3 groups namely 4-6 weeks, 6-8 weeks and >8 weeks. 22 of our patients had a symptom duration of >8 weeks, 21 patients had a symptom duration of 4-6 weeks and 12 patients had a symptom duration of 6-8 weeks.

| DURATION OF SYMPTOMS | | |
|---|---|---|
| | Freq. | % |
| 4-6 WEEKS | 21 | 38.2 |
| 6-8 WEEKS | 12 | 21.8 |
| >8 WEEKS | 22 | 40.0 |
| **Total** | **55** | **100.0** |

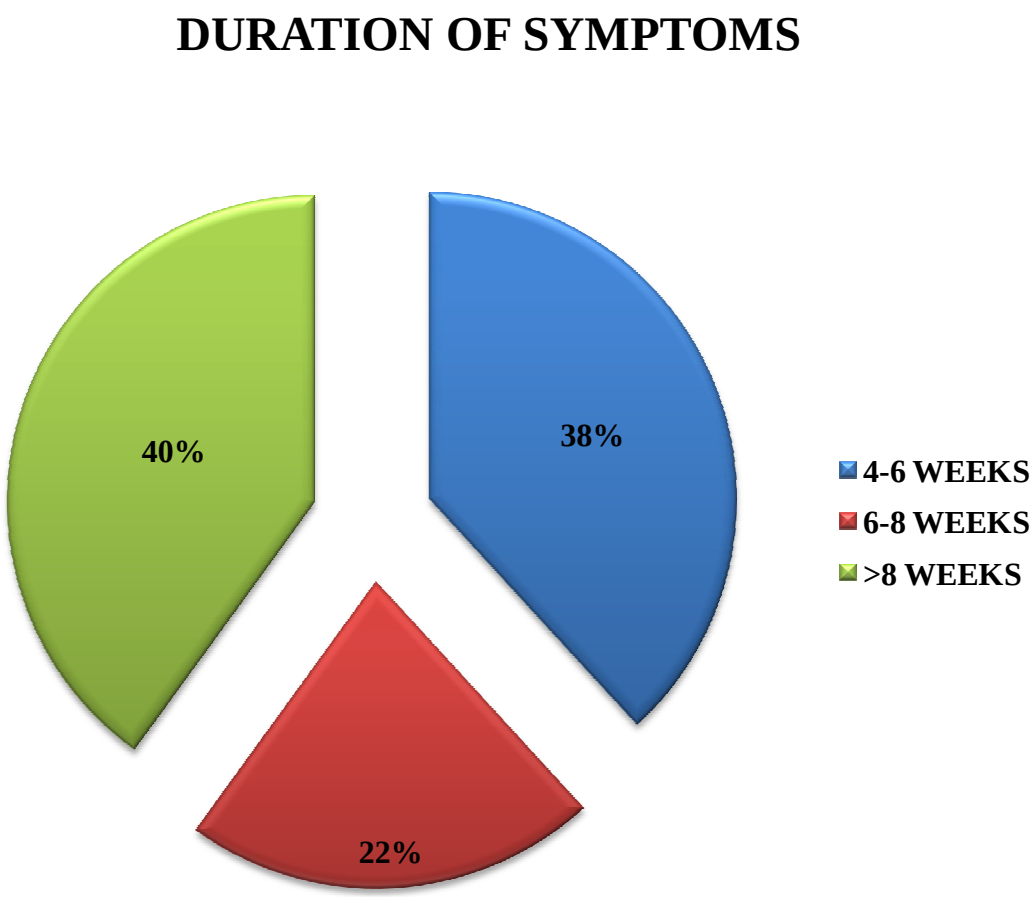



**Fig 6: Duration of Symptoms**

## PAST HISTORY OF RESPIRATORY ILLNESS:

Among 55 patients in our study 65.5% patients had no prior respiratory illness and 34.5% had a past history of respiratory illness.

| PAST HISTORY OF RESPIRATORY ILLNESS | | |
|---|---|---|
| | Freq. | % |
| NO | 36 | 65.5 |
| YES | 19 | 34.5 |
| **Total** | **55** | **100.0** |

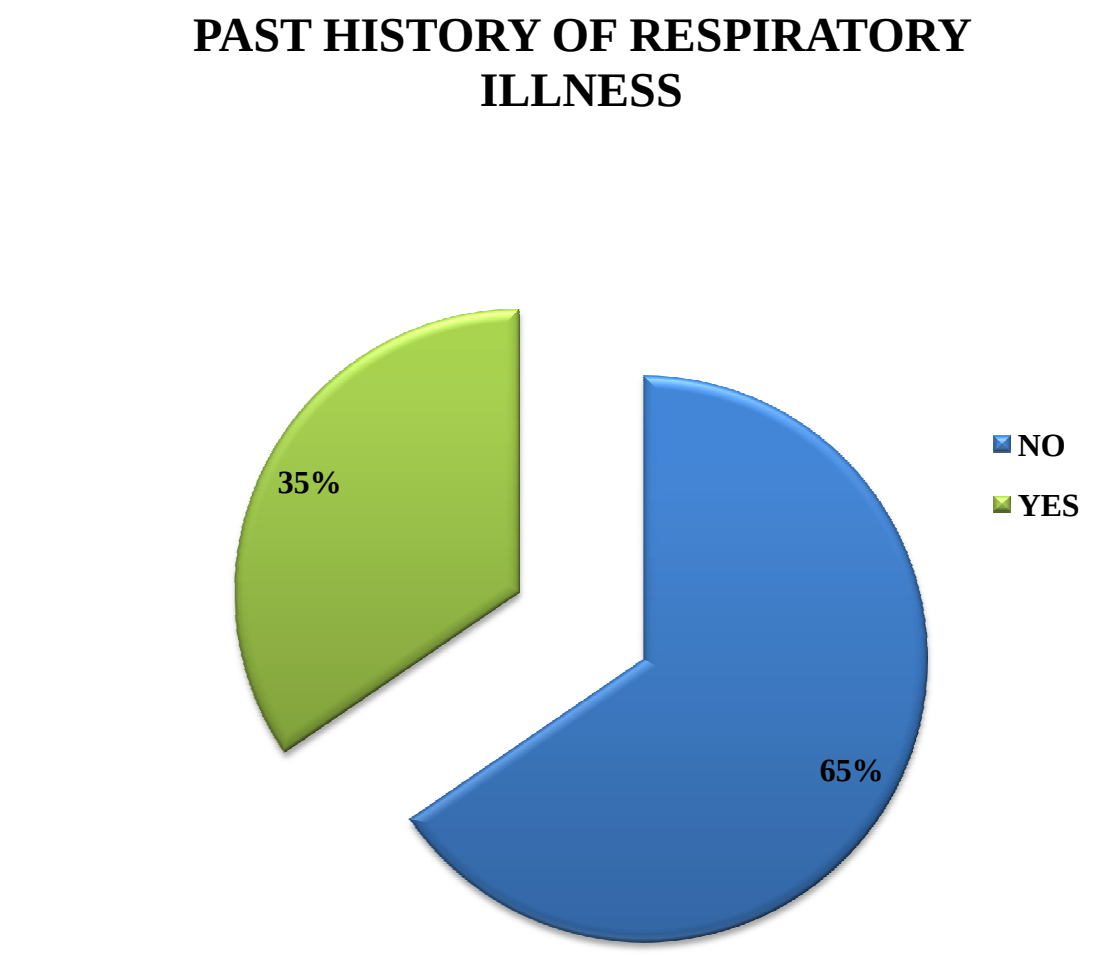



**Fig 7: Past History of Respiratory Illness**

## SMOKING STATUS OF STUDY POPULATION:

Out of 55 patients in our study, 47.3% were smokers, 52.7% were non-smokers. None of the female patients were smokers.

| SMOKER | | |
|---|---|---|
| | Freq. | % |
| NO | 29 | 52.7 |
| YES | 26 | 47.3 |
| **Total** | **55** | **100.0** |

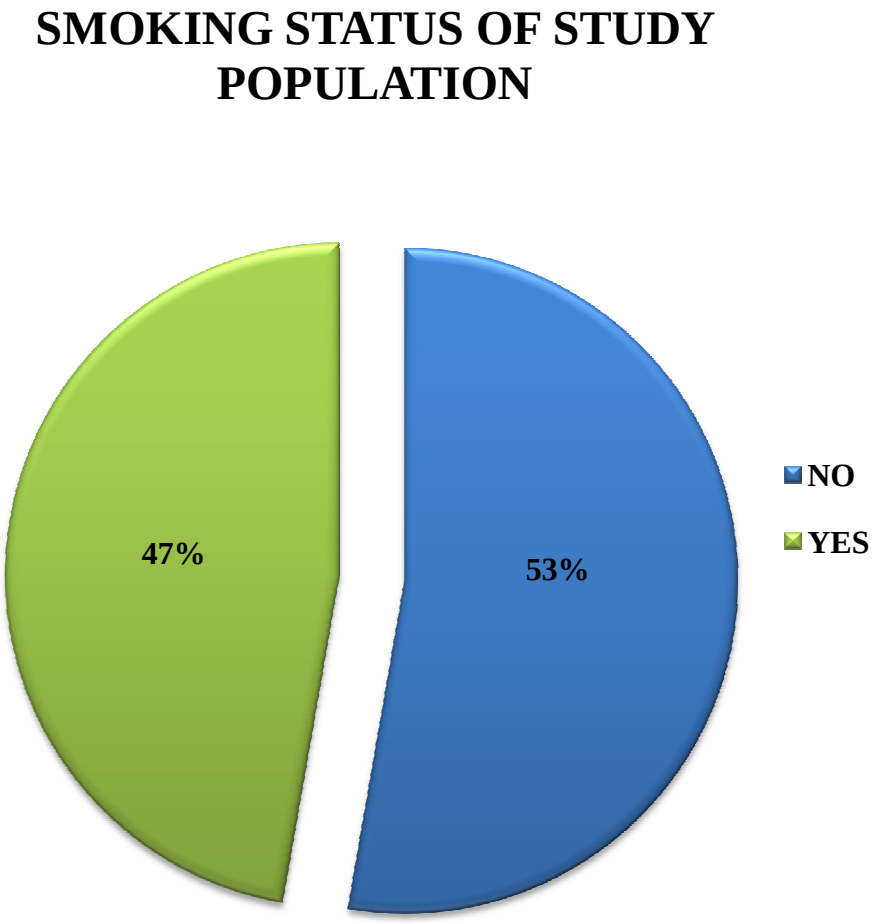



**Fig 8: Smoking Status of Study Population**

## SEVERITY/QUANTIFICATION OF SMOKING:

Out of the smokers, 31% were moderate smokers, 69% were heavy smokers.

| SEVERITY/QUANTIFICATION OF SMOKING | | |
|---|---|---|
| | Freq. | % |
| MODERATE SMOKER (101 to 300) | 8 | 31 |
| HEAVY SMOKER (>300) | 18 | 69 |
| Total | 26 | 100 |

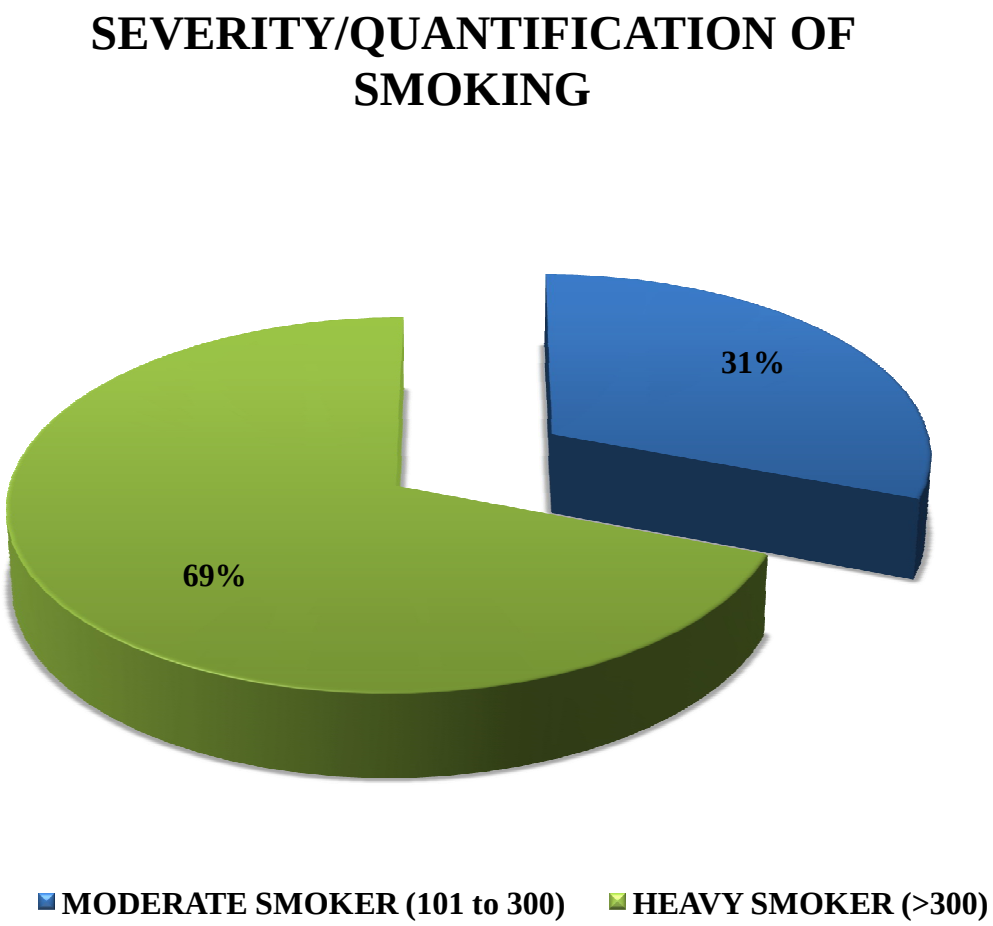



**Fig 9: Severity/Quantification of Smoking**

## HISTORY OF ALCOHOL CONSUMPTION:

Out of 55 patients in our study, 54.5% patients had a history of chronic alcohol intake. 45.5% patients were non-alcoholics. None of the female patients in our study were alcoholics.

| HISTORY OF ALCOHOL CONSUMPTION | | |
|---|---|---|
| | Freq. | % |
| NO | 25 | 45.5 |
| YES | 30 | 54.5 |
| **Total** | **55** | **100** |

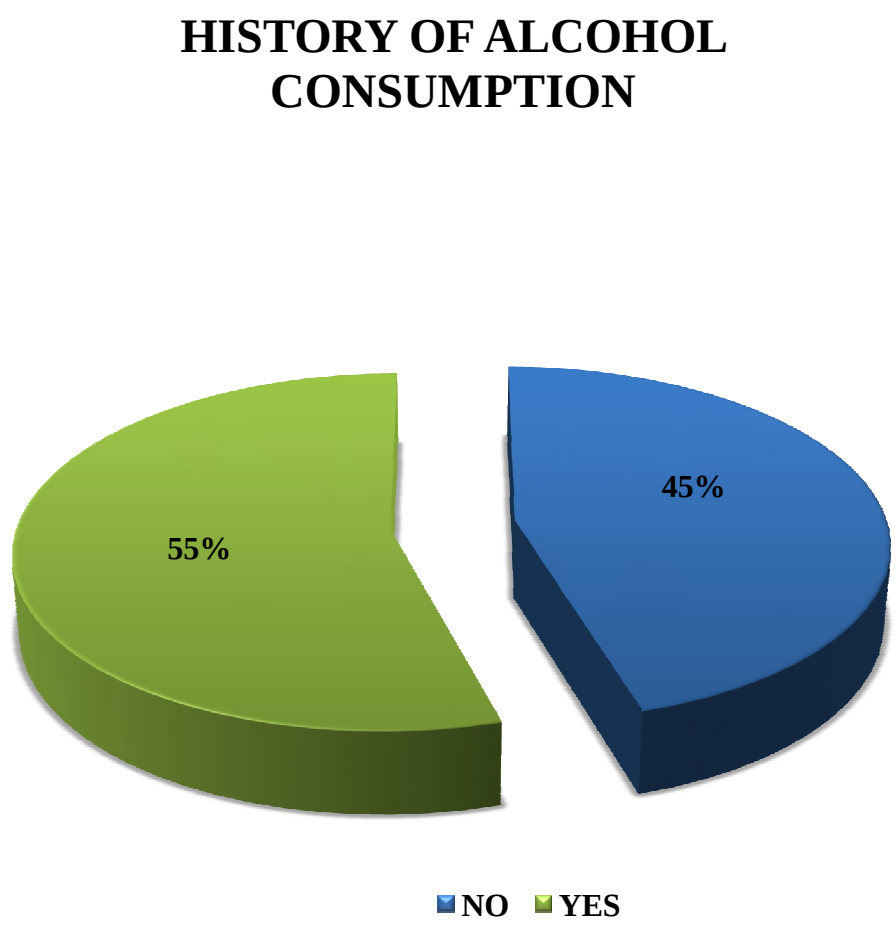



**Fig 10: History of Alcohol Consumption**

## CO MORBIDITIES :

Out of the 55 patients in our study, 45 patients had a history of co morbid disease. 10 patients had no history of any co morbidities.

| CO MORBIDITIES | | |
|---|---|---|
| | Freq. | % |
| NO | 10 | 18.2 |
| YES | 45 | 81.8 |
| **Total** | **55** | **100.0** |

Among the patients with co morbidities , diabetes was present in 40%, COPD in 22.22%, renal failure in 6.67%, anaemia in 6.67%, bronchial asthma in 4.44% and other co morbidities in 20%.

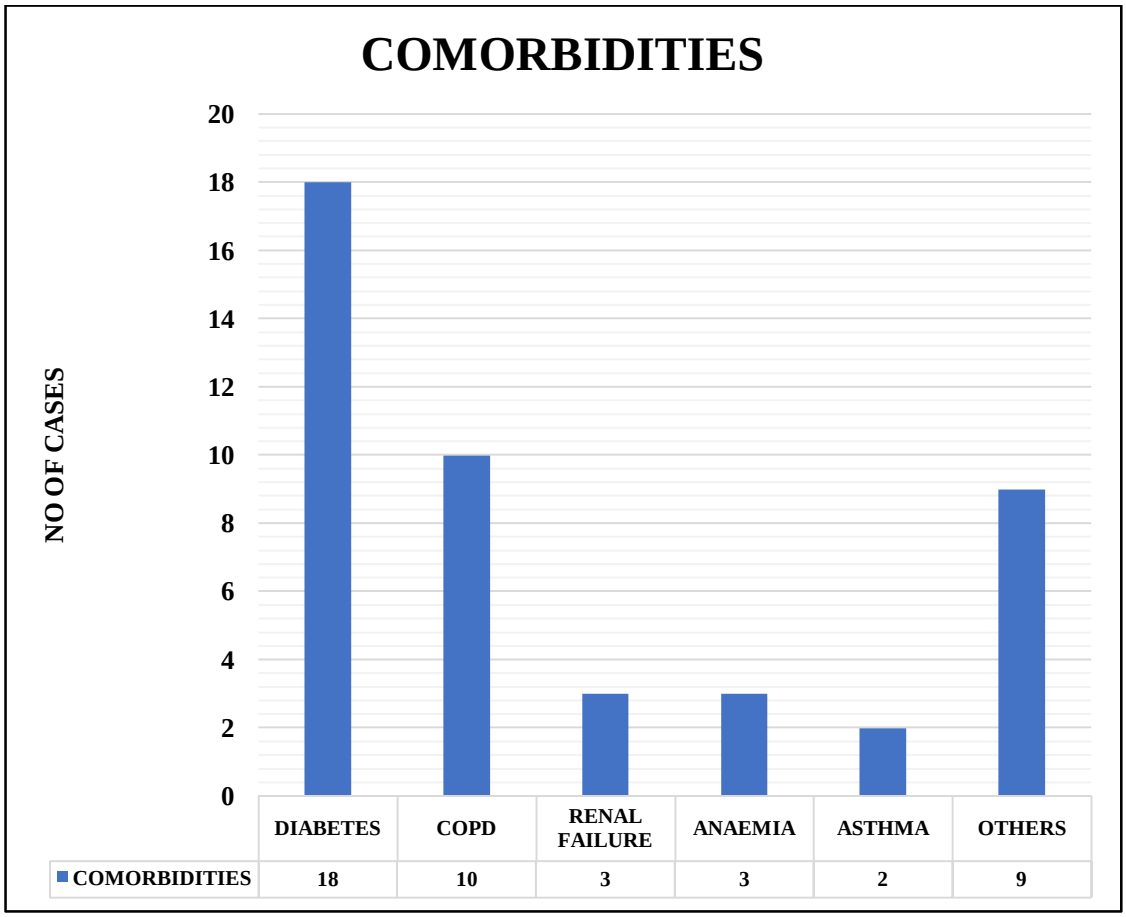



**Fig 11.2: Co Morbidities**

## AUSCULTATORY FINDING:

Of the total 55 patients in our study, crackles was the most common auscultatory finding in 80%, wheeze in 14.5% and diminished breath sounds in 5.5%.

| AUSCULTATORY FINDING | | |
|---|---|---|
| | Freq. | % |
| CRACKLES | 44 | 80.0 |
| DIMINISHED BREATH SOUND | 3 | 5.5 |
| WHEEZE | 8 | 14.5 |
| **Total** | **55** | **100.0** |

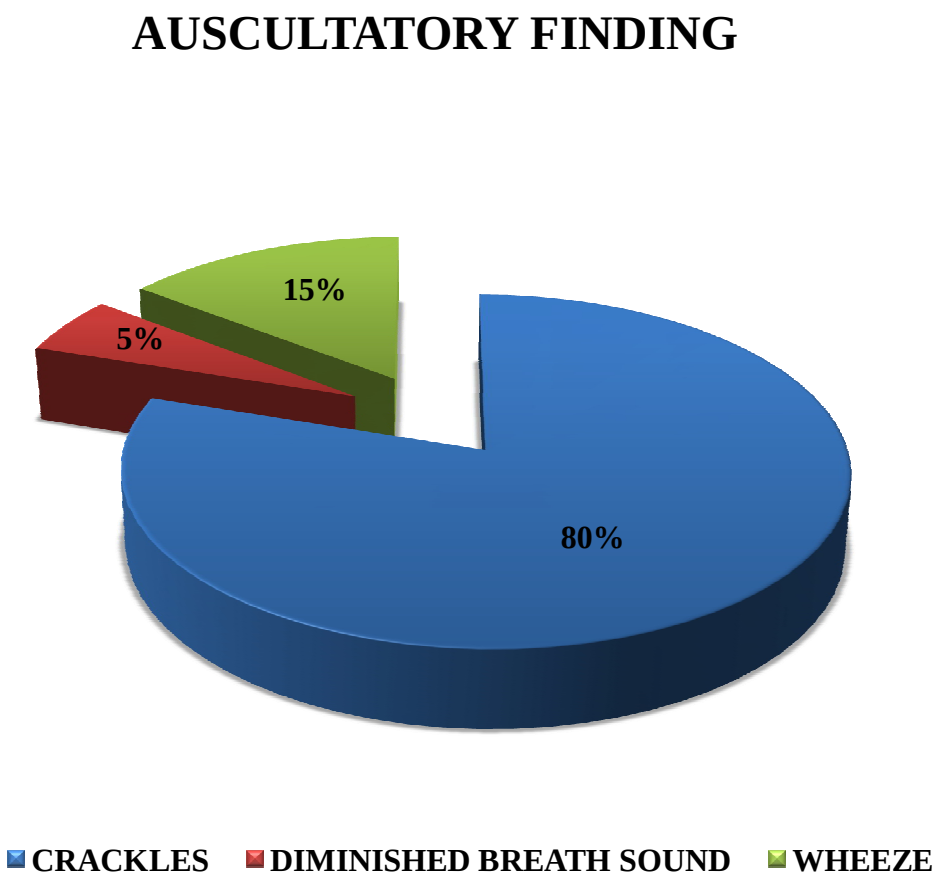



**Fig 12: Auscultatory Finding**

## LOBES INVOLVED:

In our study the lobes involved in the patients were assessed using a Computed Tomography chest. Left upper lobe involvement was seen in 25.4%, right upper lobe in 21.8%, diffuse involvement again in 21.8%, left lower lobe in 12.7%, right lower lobe in 10.9%, and right middle lobe in 7.3%.

| LOBES INVOLVED(CT-CHEST) | | |
|---|---|---|
| | Freq. | % |
| LEFT LOWER LOBE | 7 | 12.7 |
| LEFT UPPER LOBE | 13 | 25.4 |
| RIGHT LOWER LOBE | 6 | 10.9 |
| RIGHT MIDDLE LOBE | 4 | 7.3 |
| RIGHT UPPER LOBE | 12 | 21.8 |
| DIFFUSE INVOLVEMENT | 12 | 21.8 |
| **Total** | **55** | **100.0** |

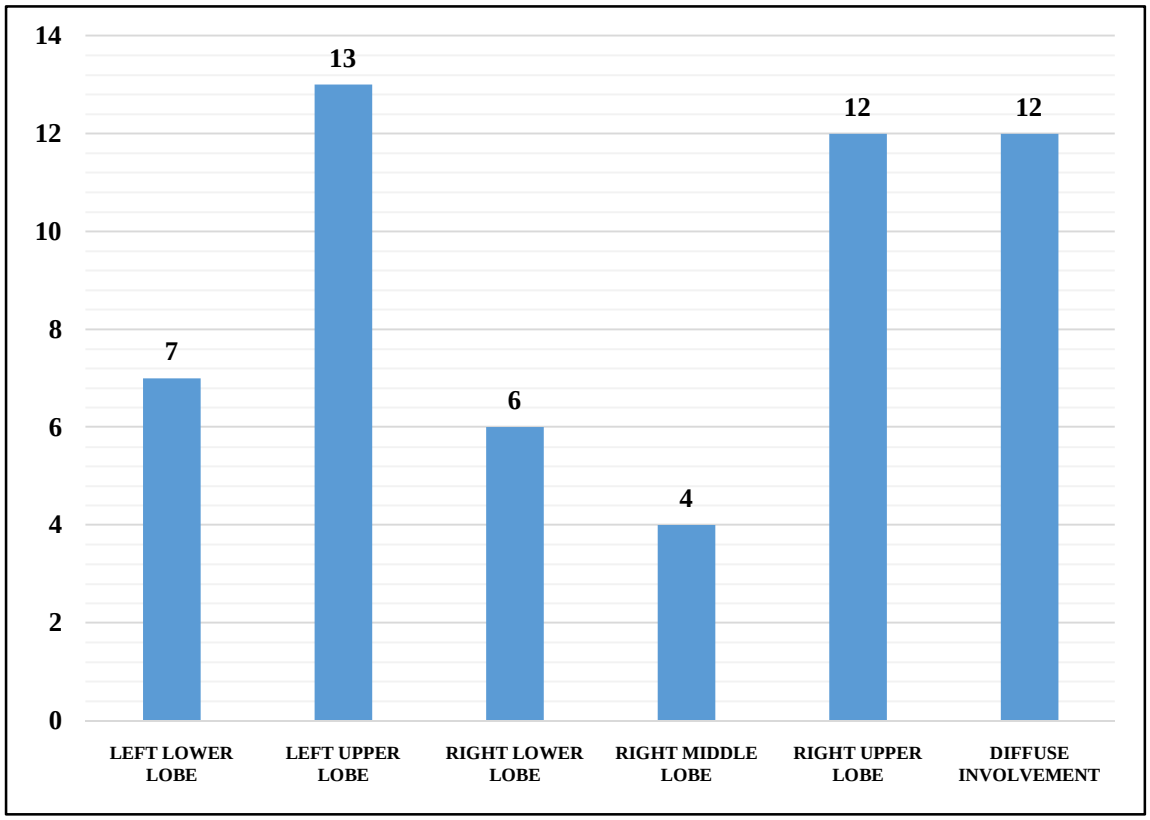



**Fig 13: Lobes Involved (CT-Chest)**

## BRONCHOSCOPY FINDINGS:

Out of 55 patients in our study the most common bronchoscopic finding was purulent secretions in 43.6%, mucosal inflammation in 38.2%, intraluminal mass/granulation tissue in 9.1%, blood stained secretions in 5.5 and mucous plugging in 3.6%.

| BRONCHOSCOPY FINDINGS | | |
|---|---|---|
| | Freq. | % |
| BLOOD STAINED SECRETIONS | 3 | 5.5 |
| INTRALUMINAL GRANULATION TISSUE/MASS | 5 | 9.1 |
| MUCOSAL INFLAMMATION | 21 | 38.2 |
| MUCOUS PLUGGING | 2 | 3.6 |
| PURULENT SECRETIONS | 24 | 43.6 |
| **Total** | **55** | **100.0** |

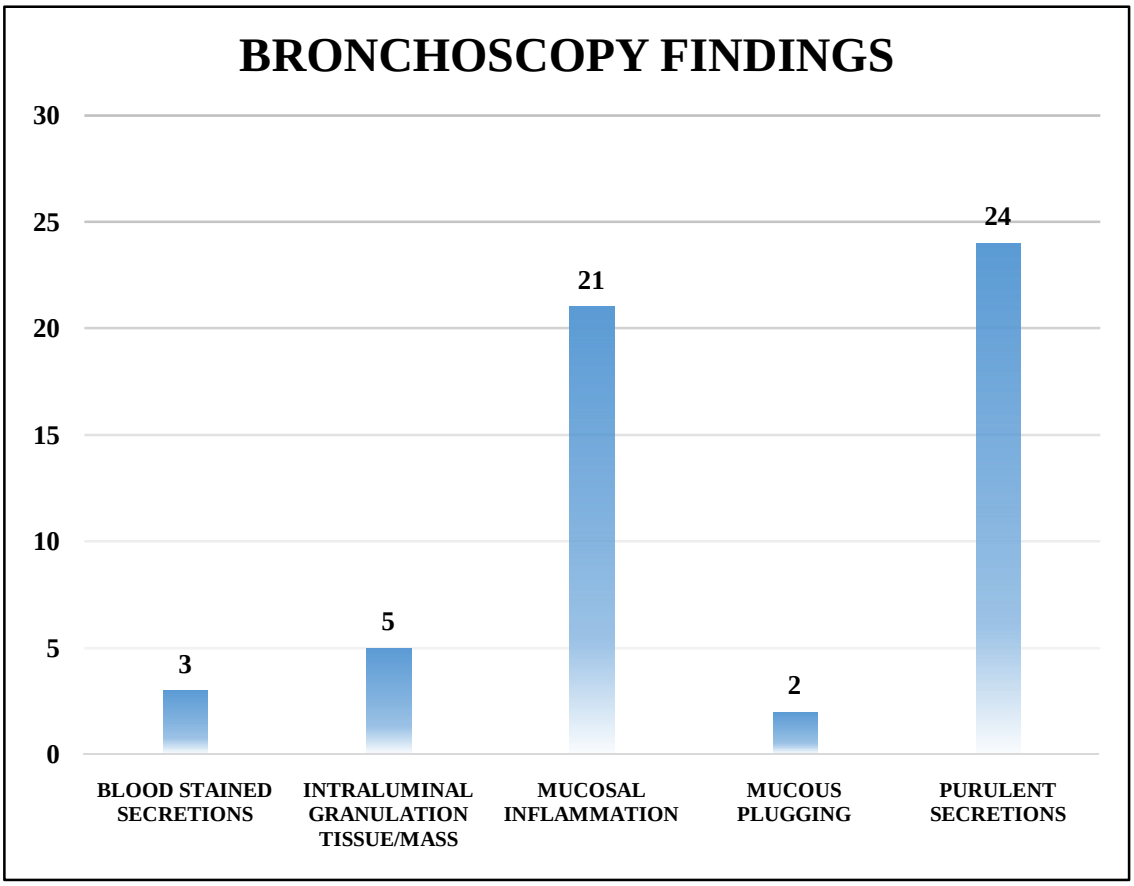



**Fig 14: Bronchoscopy Findings**

**BRONCHIAL WASH GENE XPERT:**

Out of 55 patients in our study, Bronchial wash Gene Xpert had a result of MTB DETECTED in 41.8% and MTB NOT DETECTED in 58.2%.

| BRONCHIAL WASH GENE-XPERT | | |
|---|---|---|
| | Freq. | % |
| MTB NOT DETECTED | 32 | 58.2 |
| MTB DETECTED | 23 | 41.8 |
| **Total** | **55** | **100.0** |

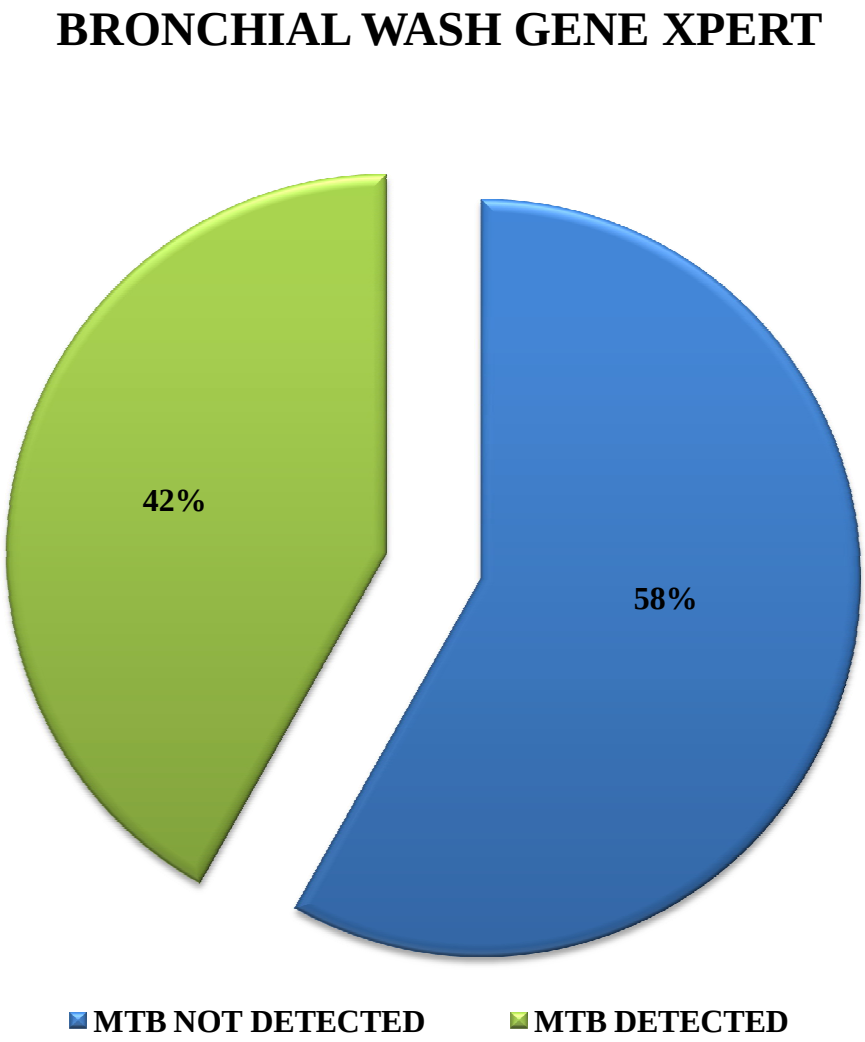



**Fig 15: Bronchial Wash Gene Xpert**

**GENE XPERT RIFAMPICIN RESISTANCE:**

Out of 23 patients in whom MTB DETECTED all 23 patients had a result of RIFAMPICIN RESISTANCE-NOT DETECTED. No patient had a result of RIFAMPICIN RESISTANCE- DETECTED.

| GENE XPERT RIFAMPICIN RESISTANCE | | |
|---|---|---|
| | Freq. | % |
| NOT DETECTED | 23 | **100.0** |
| DETECTED | 0 | 0 |
| **Total** | **23** | **100.0** |

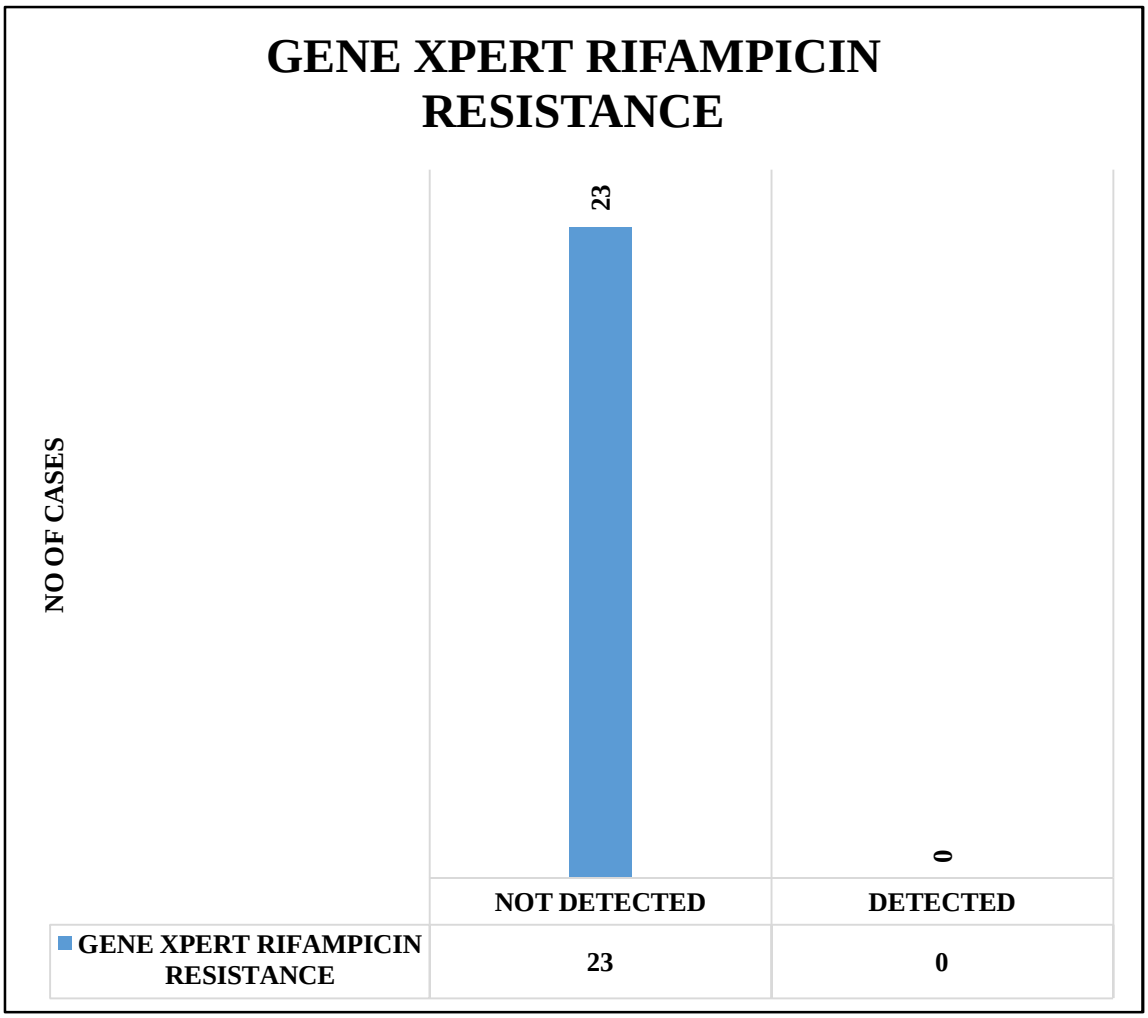



**Fig 16: Gene Xpert Rifampicin Resistance**

## BRONCHIAL WASH AFB SMEAR:

Out of 55 patients in our study Bronchial wash AFB smear was positive in 21.8% and negative in 78.2%.

| BRONCHIAL WASH AFB SMEAR | | |
|---|---|---|
| | Freq. | % |
| NEGATIVE | 43 | 78.2 |
| POSITIVE | 12 | 21.8 |
| **Total** | **55** | **100.0** |

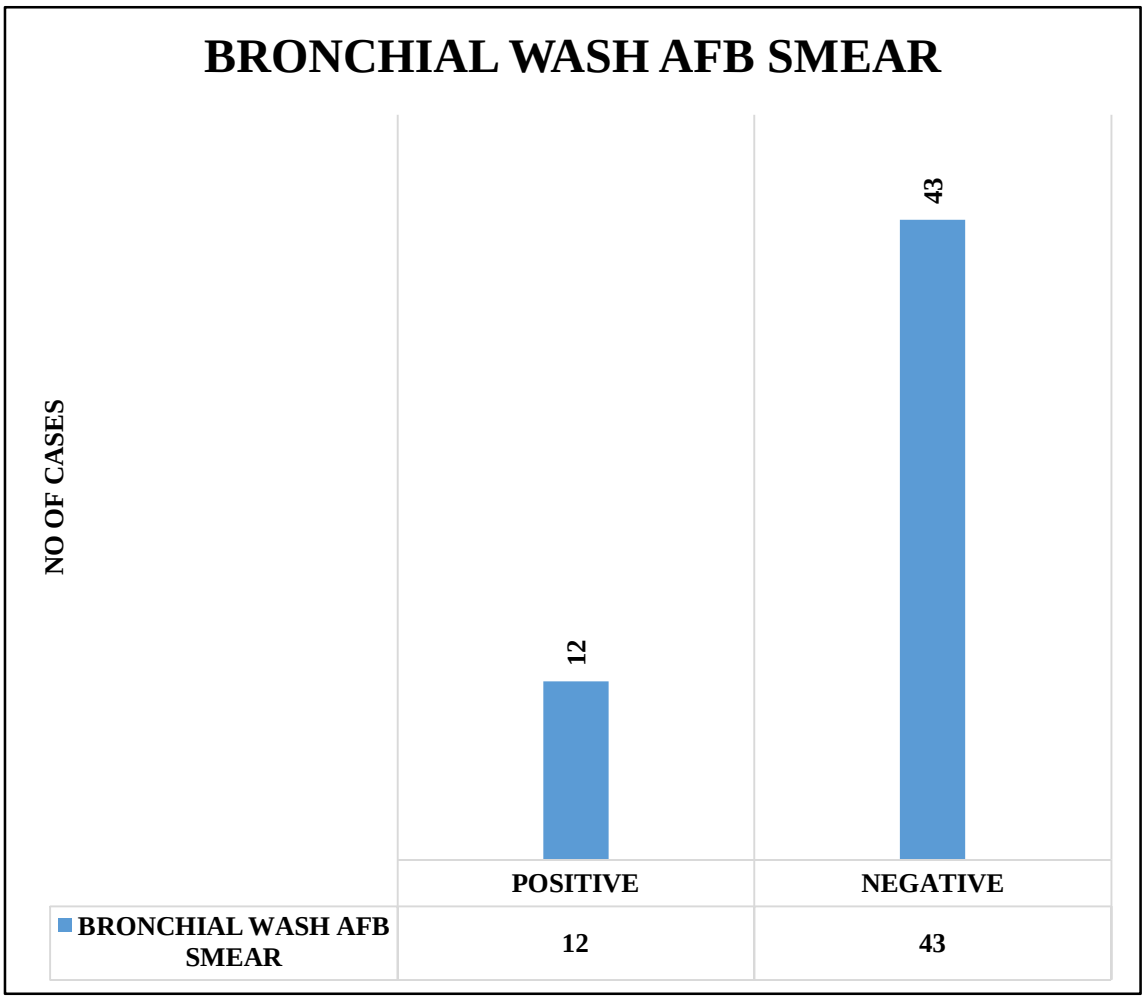



**Fig 17: Bronchial Wash AFB Smear**

## BRONCHIAL WASH BACTERIAL CULTURE:

Out of the total 55 patients in our study, Bronchial wash BACTERIAL CULTURE was contributory in arriving at a diagnosis in 14.5% of patients.

| BRONCHIAL WASH BACTERIAL CULTURE | | |
|---|---|---|
| | Freq. | % |
| NOT CONTRIBUTORY | 47 | 85.5 |
| CONTRIBUTORY TO DIAGNOSIS | 8 | 14.5 |
| **Total** | **55** | **100.0** |

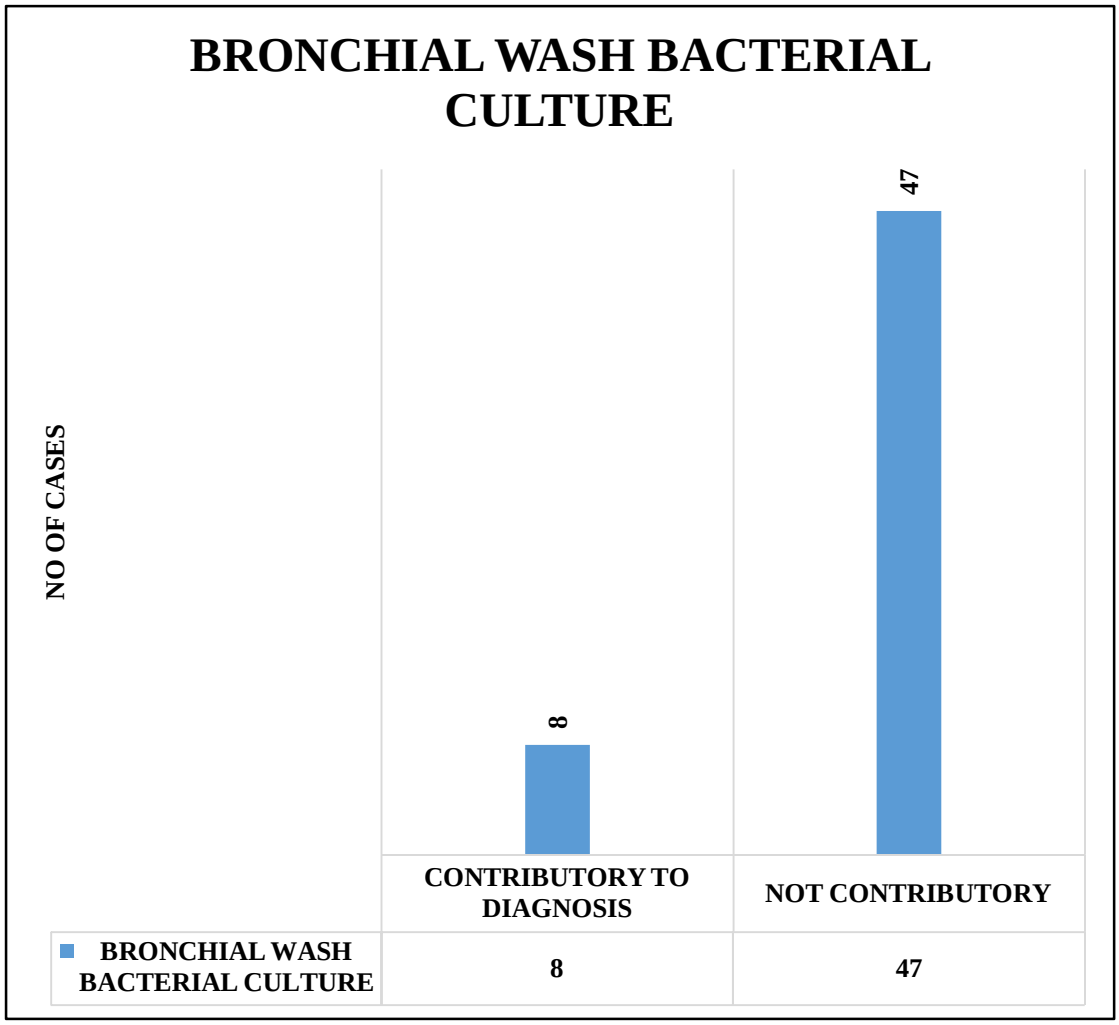



**Fig 18: Bronchial Wash Bacterial Culture**

## BRONCHIAL WASH CULTURE RESULTS:

Bronchial wash culture results that are contributory to the diagnosis are attached below.

**Table 5: Bronchial Wash Culture Results**

| BRONCHIAL WASH CULTURE RESULTS | |
|---|---|
| | Freq. |
| ACINETOBACTER | 1 |
| E.COLI | 1 |
| KLEBSIELLA PNEUMONIAE | 1 |
| NOCARDIA SPECIES | 1 |
| PSEUDOMONAS AERUGINOSA | 1 |
| PROTEUS MIRABILIS | 1 |
| PROTEUS VULGARIS | 1 |
| ACTINOMYCETES | 1 |

## BRONCHIAL WASH CYTOLOGY REPORTS:

Out of the total 55 patients in our study a cytology report of acute inflammatory pathology was obtained in 54.5% of patients, chronic inflammatory pathology in 32.7% of patients and atypical cells seen(positive for malignancy) in 12.7% of patients.

| BRONCHIAL WASH CYTOLOGY | | |
|---|---|---|
| | Freq. | % |
| ACUTE INFLAMMATORY PATHOLOGY | 30 | 54.5 |
| ATYPICAL CELLS SEEN(POSITIVE FOR MALIGNANCY) | 7 | 12.7 |
| CHRONIC INFLAMMATORY PATHOLOGY | 18 | 32.7 |
| **Total** | **55** | **100.0** |

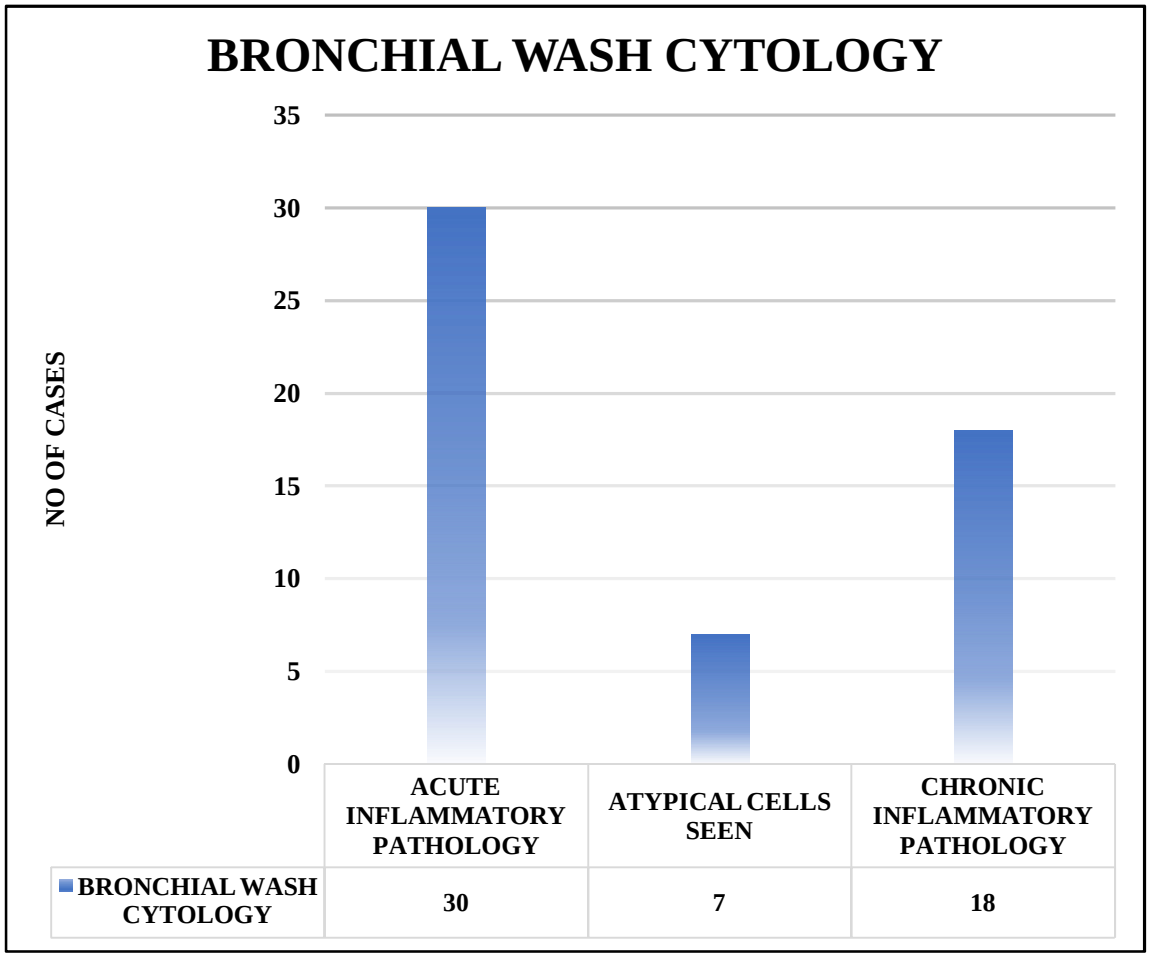



**Fig 19: Bronchial Wash Cytology**

## BRONCHIAL WASH FUNGAL SMEAR/CULTURE:

Out of the 55 patients in our study none had a positive fungal smear/culture.

## ENDOBRONCHIAL BIOPSY:

Out of the 55 patients in our study, endobronchial biopsy was done in 6 patients and was contributory to the diagnosis in all 6 of them. 4 cases were diagnosed as carcinoma, 1 as carcinoid tumor and 1 as fungal pneumonia (mucormycosis).

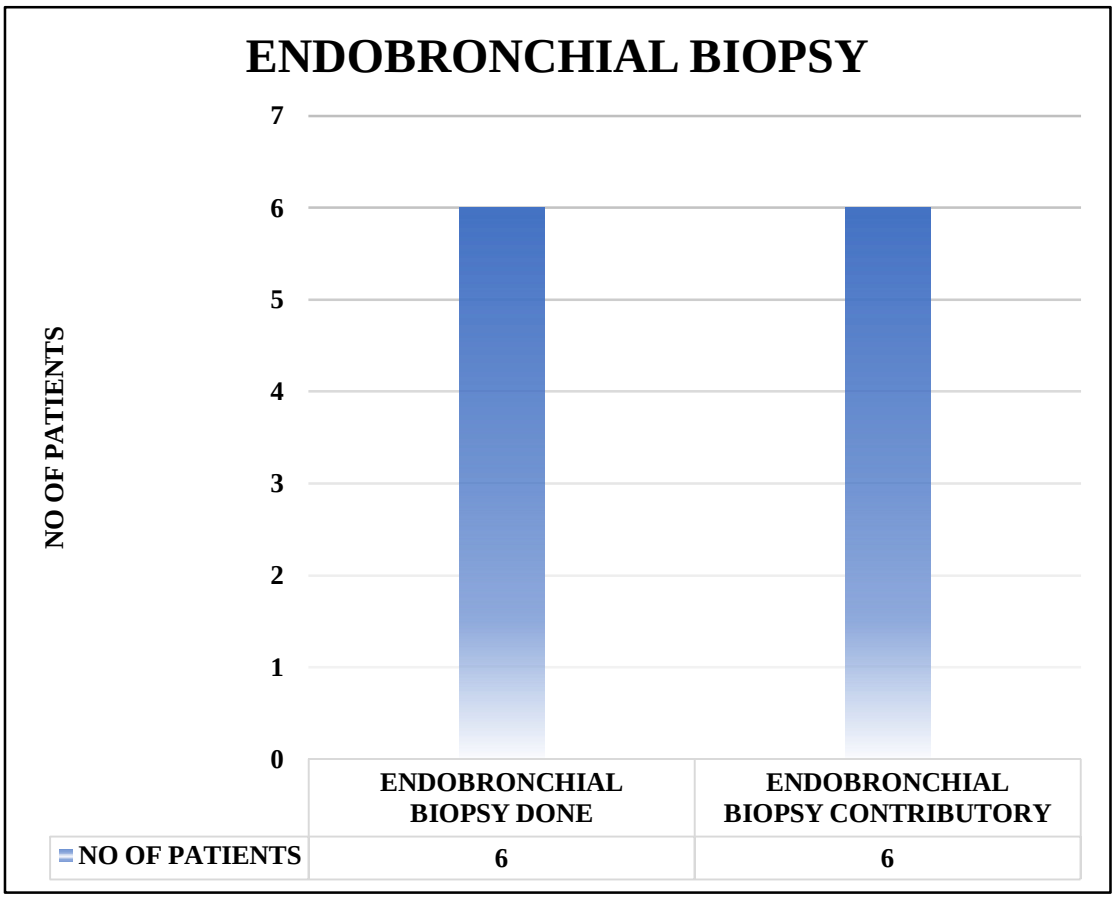



**Fig 20: Endobronchial Biopsy**

## TRANSBRONCHIAL LUNG BIOPSY (TBLB):

Out of the 55 patients in our study, TBLB was done in 3 patients and it was contributory to diagnosis in all 3 patients. 1 case was diagnosed as BOOP, 1 as Chronic HSP (bird fanciers lung) and 1 Actinomycetes pneumonia.

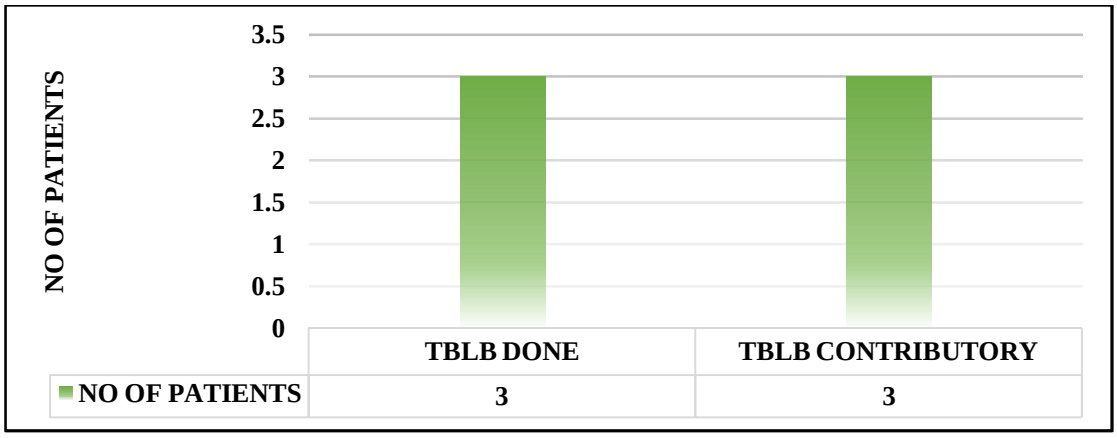



**Fig 21: Transbronchial Lung Biopsy**

## CT-GUIDED BIOPSY:

Out of the 55 patients in our study, CT-GUIDED BIOPSY was done in 4 patients and it was contributory to diagnosis in all 4 patients. 3 cases were diagnosed as carcinoma and 1 as lipoid pneumonia.

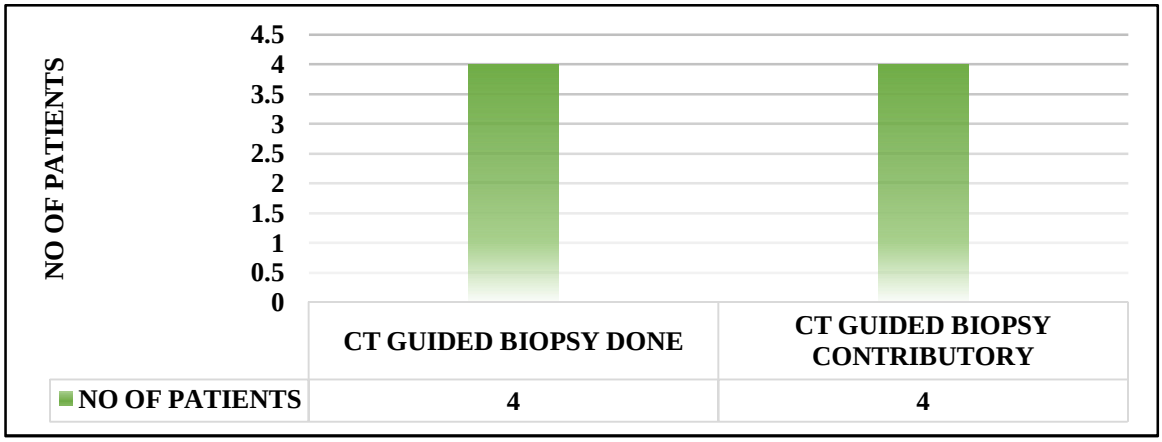



**Fig 22: CT-Guided Biopsy**

## POST FOB SPUTUM AFB SMEAR:

Out of 55 patients in our study, POST FOB SPUTUM AFB SMEAR was done in all 55 patients and it was positive and contributory to the diagnosis in 4 patients.

| POST FOB SPUTUM AFB SMEAR | | |
|---|---|---|
| | Freq. | % |
| POSITIVE | 4 | 7.3 |
| NEGATIVE | 51 | 92.7 |
| **Total** | **55** | **100.0** |

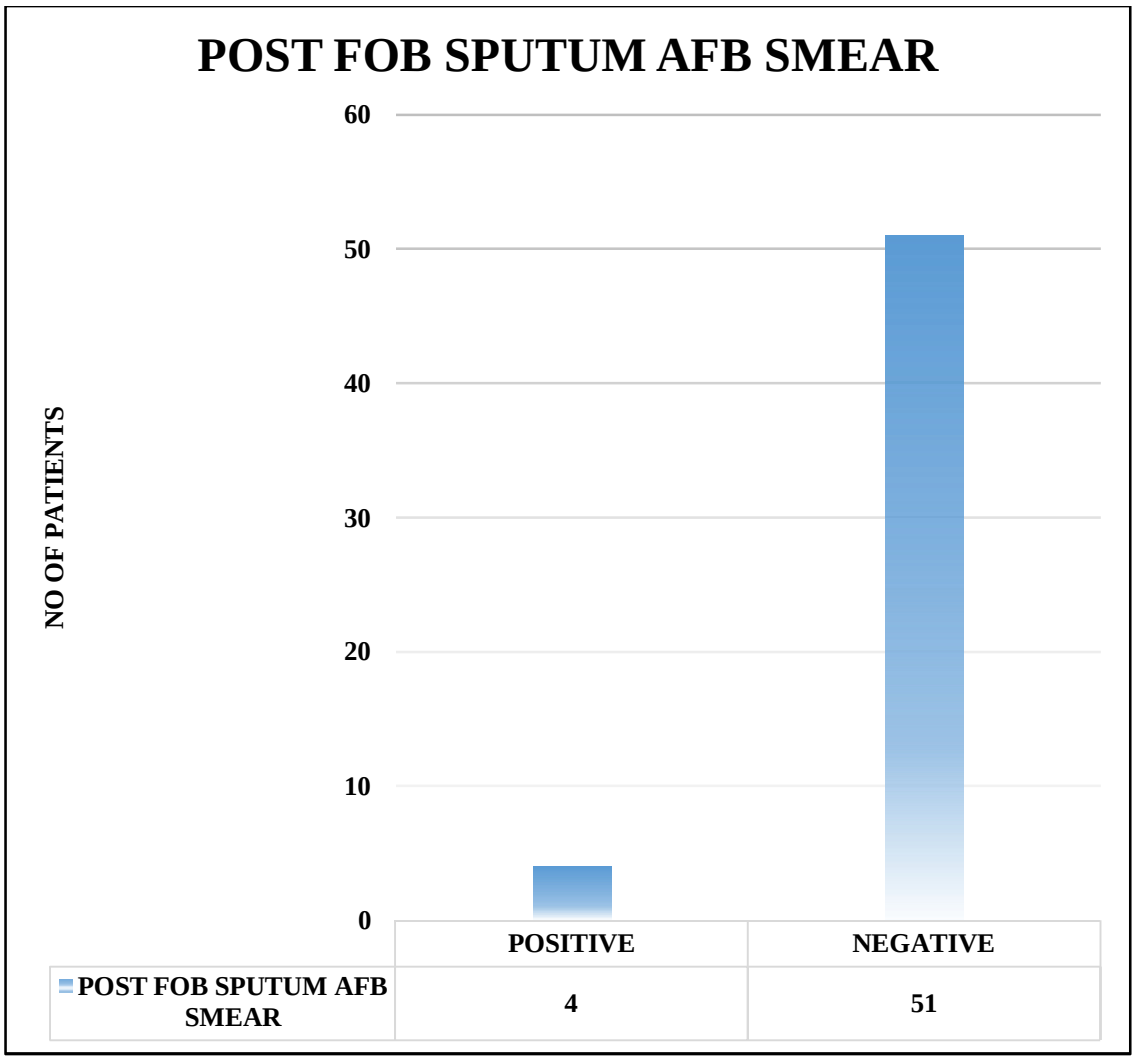



**Fig 23: Post Fob Sputum AFB Smear**

## POST FOB SPUTUM CYTOLOGY:

Out of the 55 patients in our study, POST FOB SPUTUM CYTOLOGY was done in all 55 patients and it was contributory in diagnosing the cause of NRP in 4 patients.

| POST FOB SPUTUM CYTOLOGY | | |
|---|---|---|
| | Freq. | % |
| CONTRIBUTORY | 4 | 7.3 |
| NOT CONTRIBUTORY | 51 | 92.7 |
| **Total** | **55** | **100.0** |

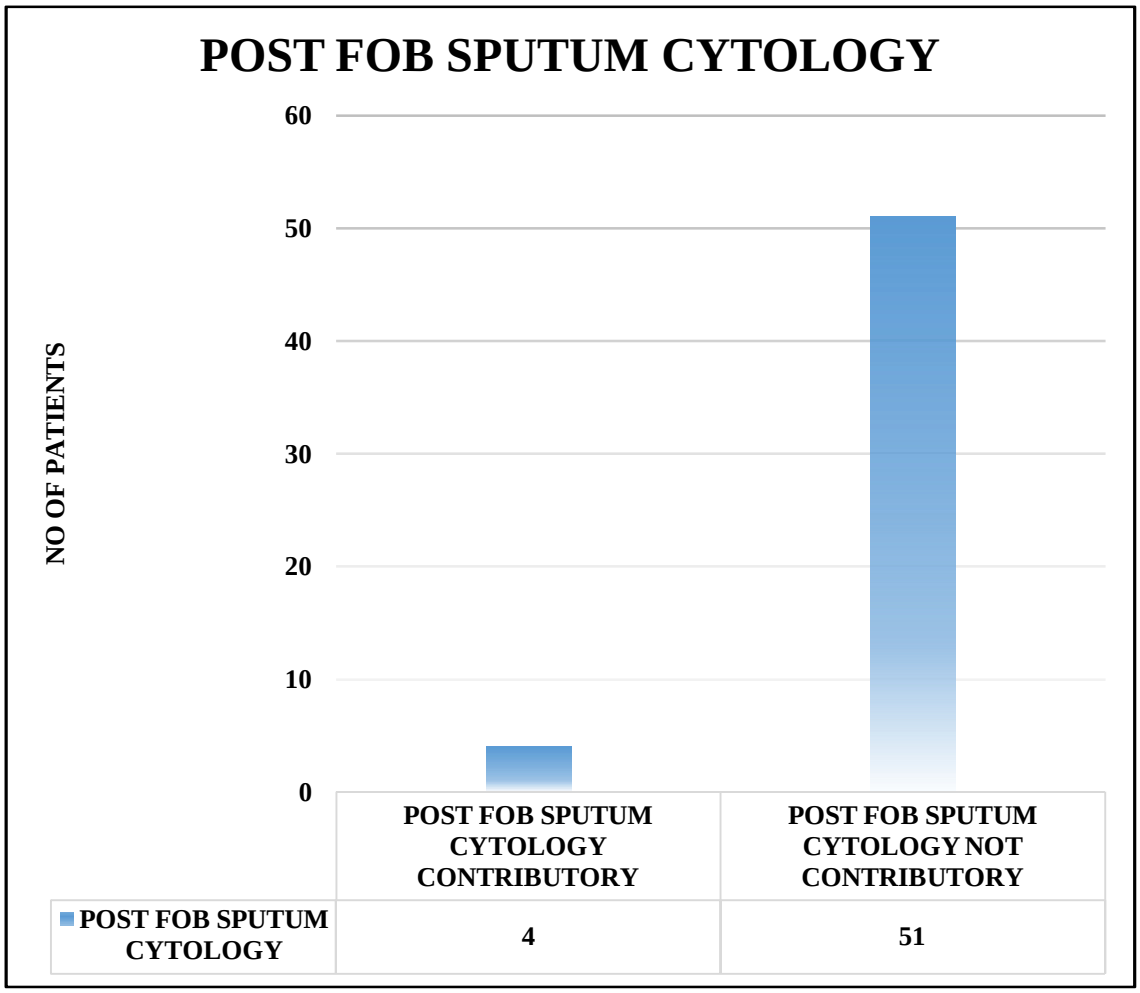



**Fig 24: Post Fob Sputum Cytology**

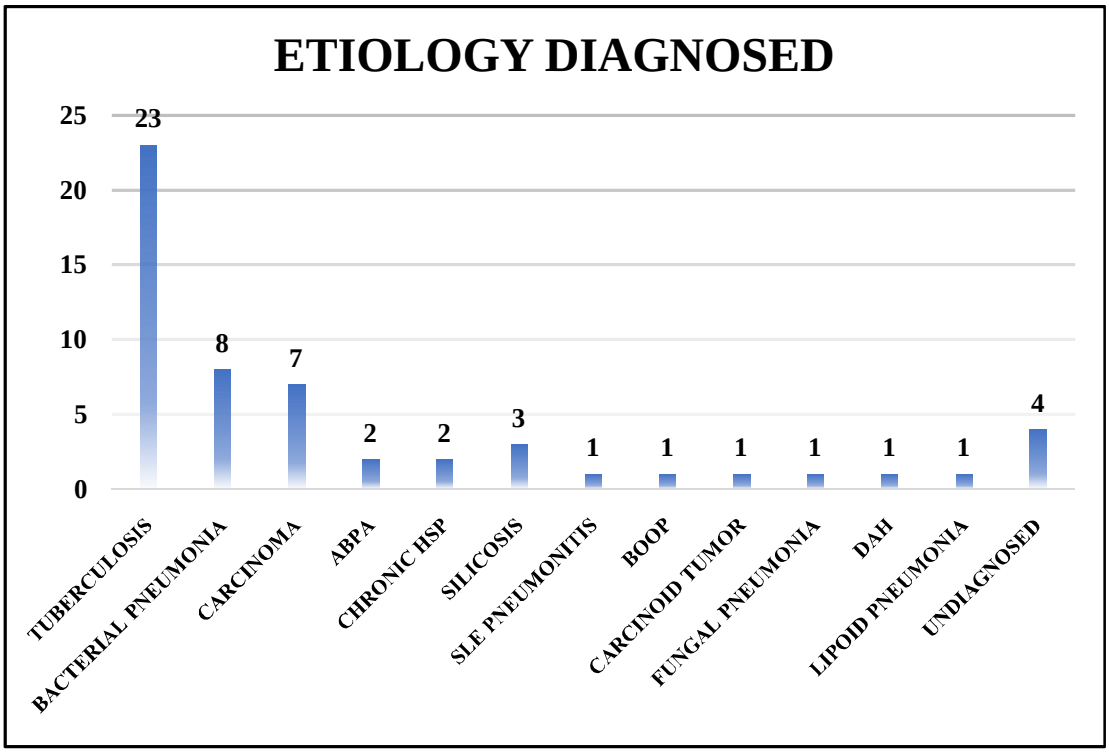
## ETIOLOGY DIAGNOSED:

Out of the 55 patients in our study, etiology of NRP was diagnosed in 92.7% (n=51) of patients and not diagnosed in 7.3% (n=4) of patients.

| ETIOLOGY | | |
|---|---|---|
| | Freq. | % |
| YES | 51 | 92.7 |
| NO | 4 | 7.3 |
| **Total** | **55** | **100.0** |

**Table 6: Etiology Diagnosed**

| ETIOLOGY DIAGNOSED | |
|---|---|
| | NO OF CASES |
| TUBERCULOSIS | 23 |
| BACTERIAL PNEUMONIA | 8 |
| CARCINOMA | 7 |
| ALLERGIC BRONCHOPULMONARY ASPERGILLOSIS(ABPA) | 2 |
| CHRONIC HYPERSENSITIVITY PNEUMONITIS | 2 |
| SILICOSIS | 3 |
| SLE PNEUMONITIS | 1 |
| BRONCHIOLITIS OBLITERANS ORGANISING PNEUMONIA(BOOP) | 1 |
| CARCINOID TUMOR | 1 |
| FUNGAL PNEUMONIA (MUCOR) | 1 |
| DAH WITH PULMONARY RENAL SYNDROME | 1 |
| LIPOID PNEUMONIA | 1 |
| UNDIAGNOSED | 4 |
| **Total** | **55** |



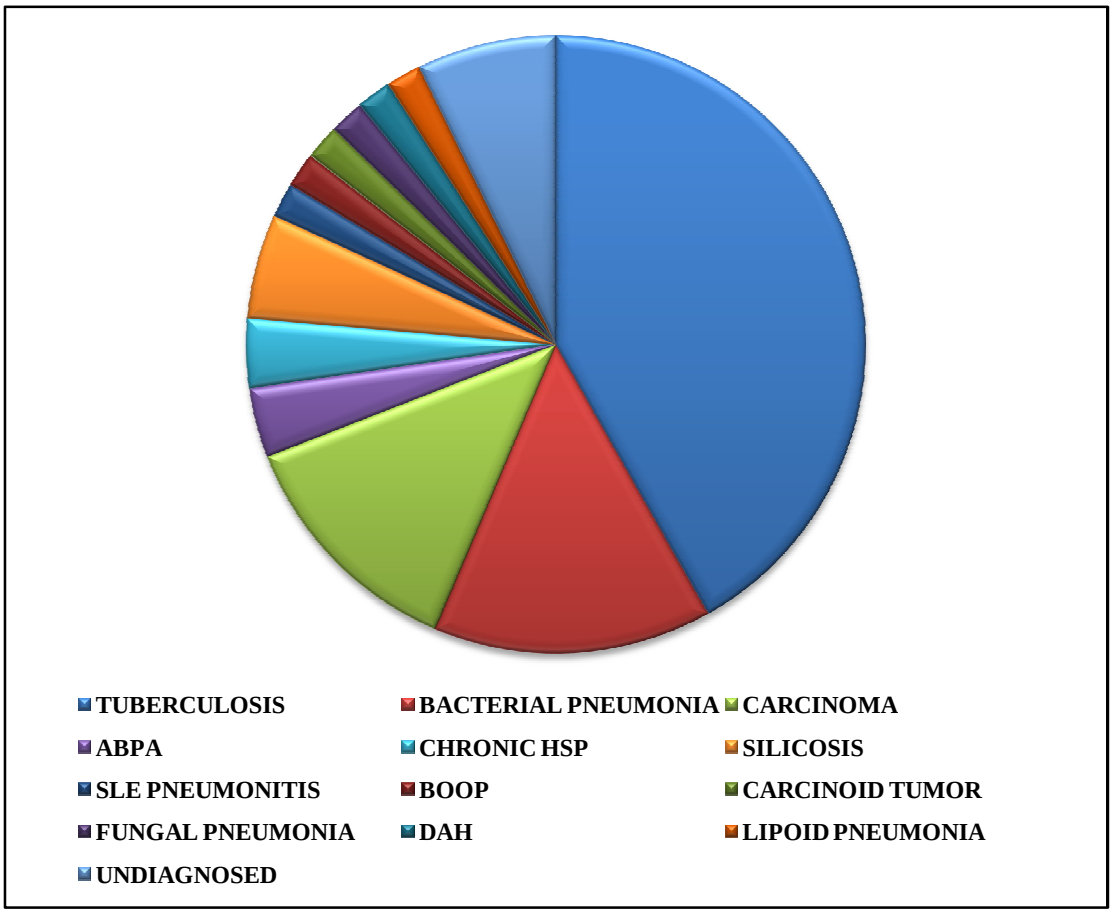




**Fig 26.1, 26.2: Etiology Diagnosed**

## AGE DISTRIBUTION IN TUBERCULOSIS:

Out of 55 patients in our study, in patients where tuberculosis was diagnosed the most common age group affected was 50-60 years, followed by 41-50 years, >60 years, <30 years and 31-40 years in that order, with a P-value of 0.504.

| CORRELATION BETWEEN AGE GROUP AND TUBERCULOSIS DIAGNOSIS | | | | | |
|---|---|---|---|---|---|
| | | TB | | Total | Chi Square |
| | | OTHER DIAGNOSIS | TUBERCULOSIS | | P-Value |
| Age Group | < 30 | 2 | 4 | 6 | 0.504 |
| | 31 to 40 | 5 | 1 | 6 | |
| | 41 to 50 | 7 | 6 | 13 | |
| | 51 to 60 | 13 | 8 | 21 | |
| | > 60 | 5 | 4 | 9 | |
| Total | | 32 | 23 | 55 | |

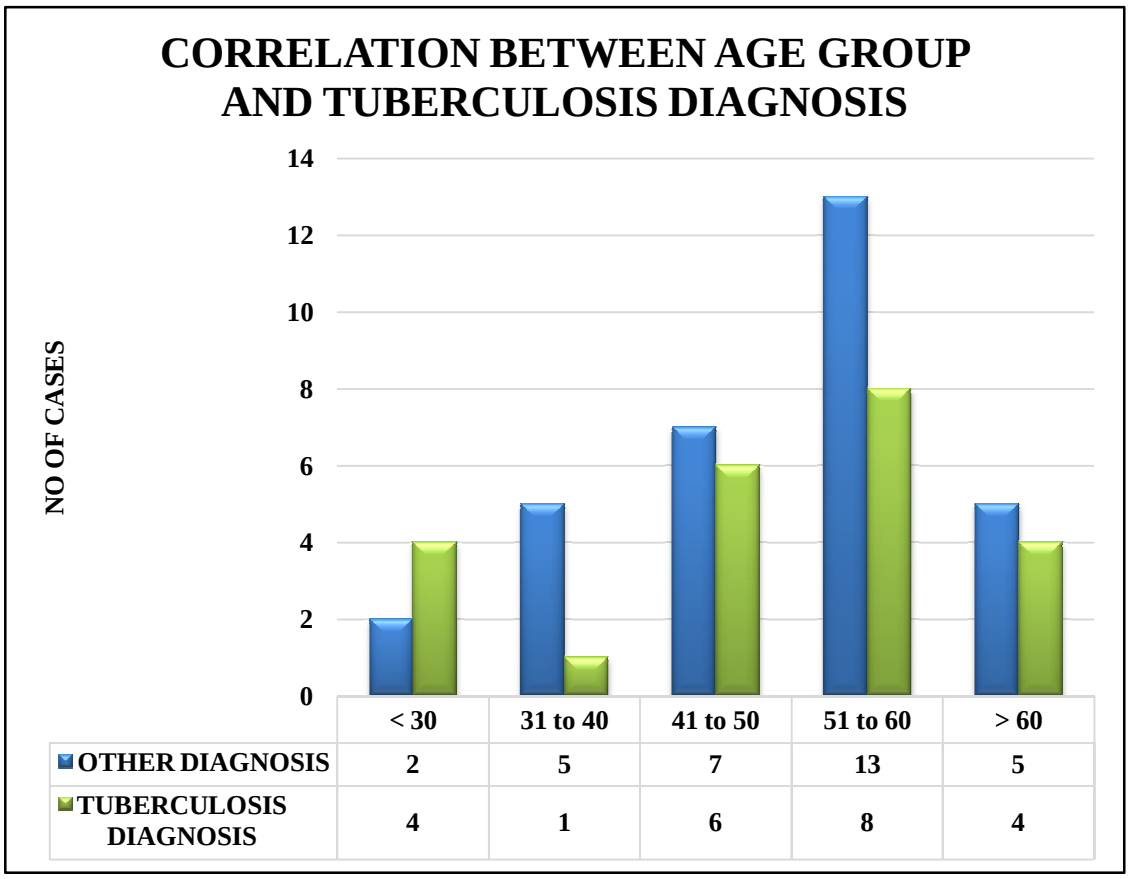



**Fig 27: Correlation Between Age Group And Tuberculosis Diagnosis**

## AGE DISTRIBUTION IN CARCINOMA:

Out of 55 patients in our study, in patients where carcinoma was diagnosed the most common age group affected was 51-60 years, followed by >60 years, 41-50 years and <30 years in that order with a P-value of 0.680

| CORRELATION BETWEEN AGE GROUP AND CARCINOMA DIAGNOSIS | | | | | |
|---|---|---|---|---|---|
| | | Carcinoma | | Total | Chi Square |
| | | Other diagnosis | Carcinoma | | P-Value |
| Age Group | < 30 | 5 | 1 | 6 | 0.680 |
| | 31 to 40 | 6 | 0 | 6 | |
| | 41 to 50 | 12 | 1 | 13 | |
| | 51 to 60 | 17 | 4 | 21 | |
| | > 60 | 7 | 2 | 9 | |
| Total | | 47 | 8 | 55 | |

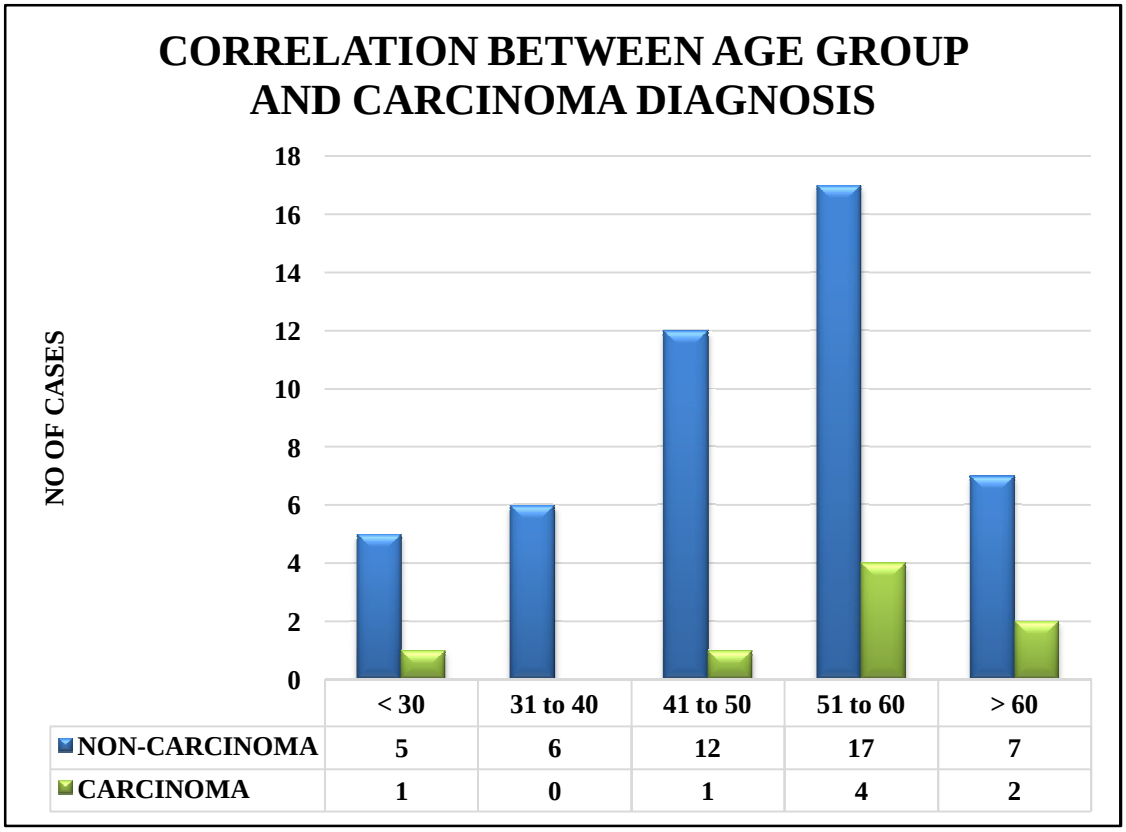



**Fig 28: Correlation Between Age And Carcinoma Diagnosis**

## AGE DISTRIBUTION IN BACTERIAL PNEUMONIA:

Out of 55 patients in our study, in patients where bacterial pneumonia was diagnosed the most common age group affected was 41-50 years, followed by >60 years, 51-60 years and 31-40 years in that order with a P-value of 0.211

| CORRELATION BETWEEN AGE GROUP AND BACTERIAL PNEUMONIA | | | | | |
|---|---|---|---|---|---|
| | | Bacterial pneumonia | | Total | Chi Square |
| | | Other diagnosis | Bacterial pneumonia | | P-Value |
| Age Group | < 30 | 6 | 0 | 6 | 0.211 |
| | 31 to 40 | 5 | 1 | 6 | |
| | 41 to 50 | 9 | 4 | 13 | |
| | 51 to 60 | 20 | 1 | 21 | |
| | > 60 | 7 | 2 | 9 | |
| Total | | 47 | 8 | 55 | |

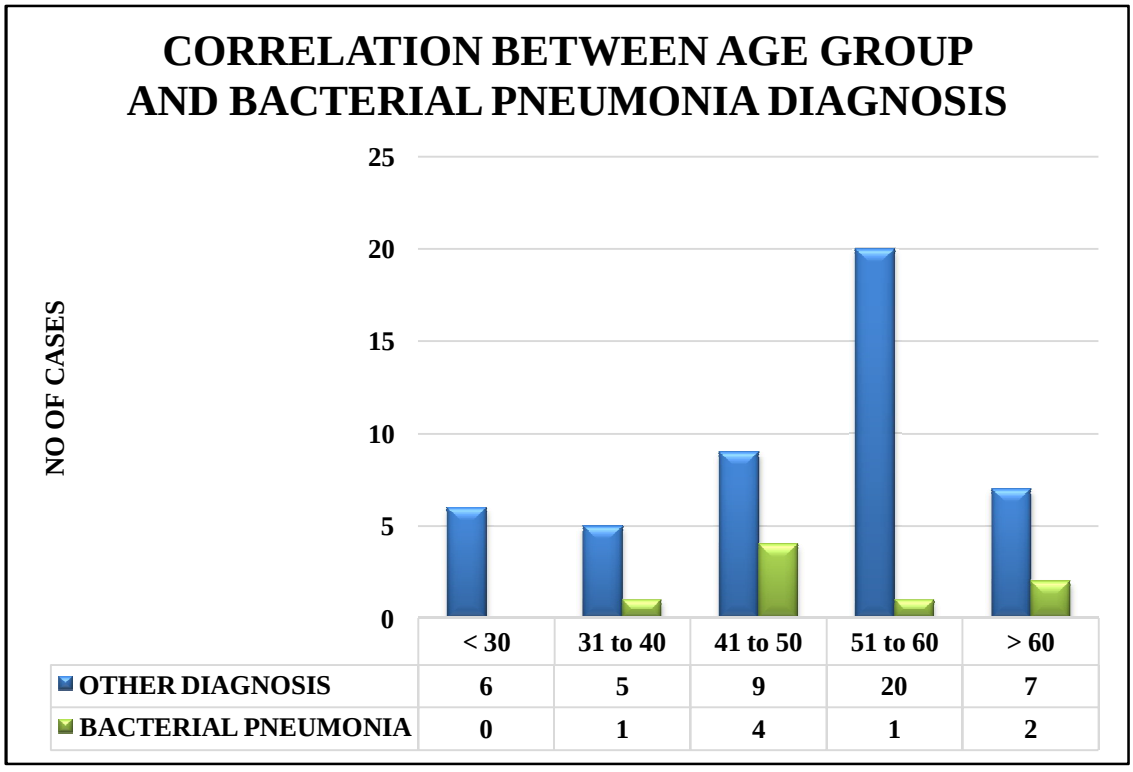



**Fig 29: Correlation Between Age Group And Bacterial Pneumonia**

## PRESENTING SYMPTOMS IN TUBERCULOSIS:

Out of 55 patients in our study, in patients where tuberculosis was diagnosed, the most common presenting symptom was cough with expectoration, followed by hemoptysis, cough, dyspnea and fever in that order, with a P-value of 0.093

| CORRELATION BETWEEN SYMPTOMS AND TUBERCULOSIS DIAGNOSIS | | | | | |
|---|---|---|---|---|---|
| | | TB | | Total | Chi Square |
| | | Other Diagnosis | Tuberculosis | | P-Value |
| SYMPTOMS | Cough | 2 | 1 | 3 | 0.093 |
| | Cough With Expectoration | 13 | 17 | 30 | |
| | Dyspnea | 8 | 1 | 9 | |
| | Chest Pain | 4 | 0 | 4 | |
| | Hemoptysis | 3 | 3 | 6 | |
| | Fever | 2 | 1 | 3 | |
| Total | | 32 | 23 | 55 | |

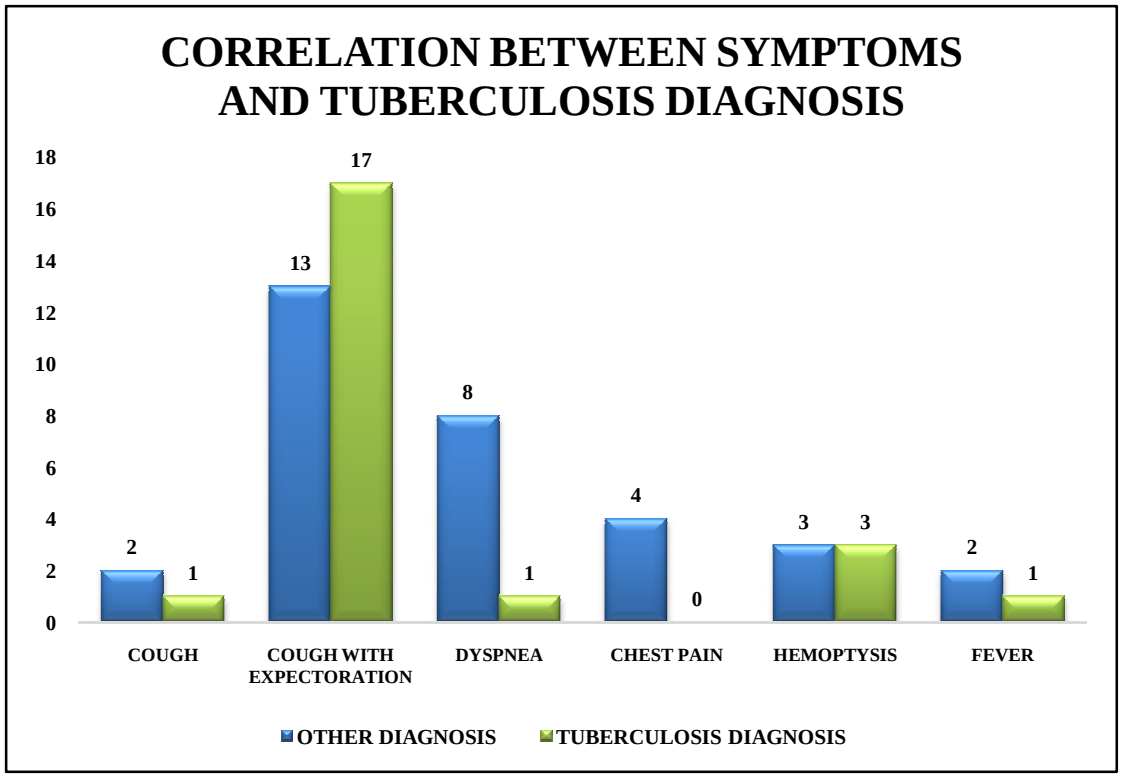



**Fig 30: Correlation Between Presenting Symptoms And Tuberculosis Diagnosis**

## PRESENTING SYMPTOMS IN CARCINOMA:

Out of 55 patients in our study, in patients where carcinoma was diagnosed, the most common presenting symptom was chest pain, followed by hemoptysis, cough with expectoration and cough in that order, **with a P-value of 0.000 which is statistically significant**.

| CORRELATION BETWEEN SYMPTOMS AND CARCINOMA DIAGNOSIS | | | | | |
|---|---|---|---|---|---|
| | | Carcinoma | | Total | Chi Square |
| | | Other diagnosis | Carcinoma | | P-Value |
| SYMPTOMS | Cough | 2 | 1 | 3 | 0.000 |
| | Cough With Expectoration | 29 | 1 | 30 | |
| | Dyspnea | 9 | 0 | 9 | |
| | Chest Pain | 0 | 4 | 4 | |
| | Hemoptysis | 4 | 2 | 6 | |
| | Fever | 3 | 0 | 3 | |
| Total | | 47 | 8 | 55 | |

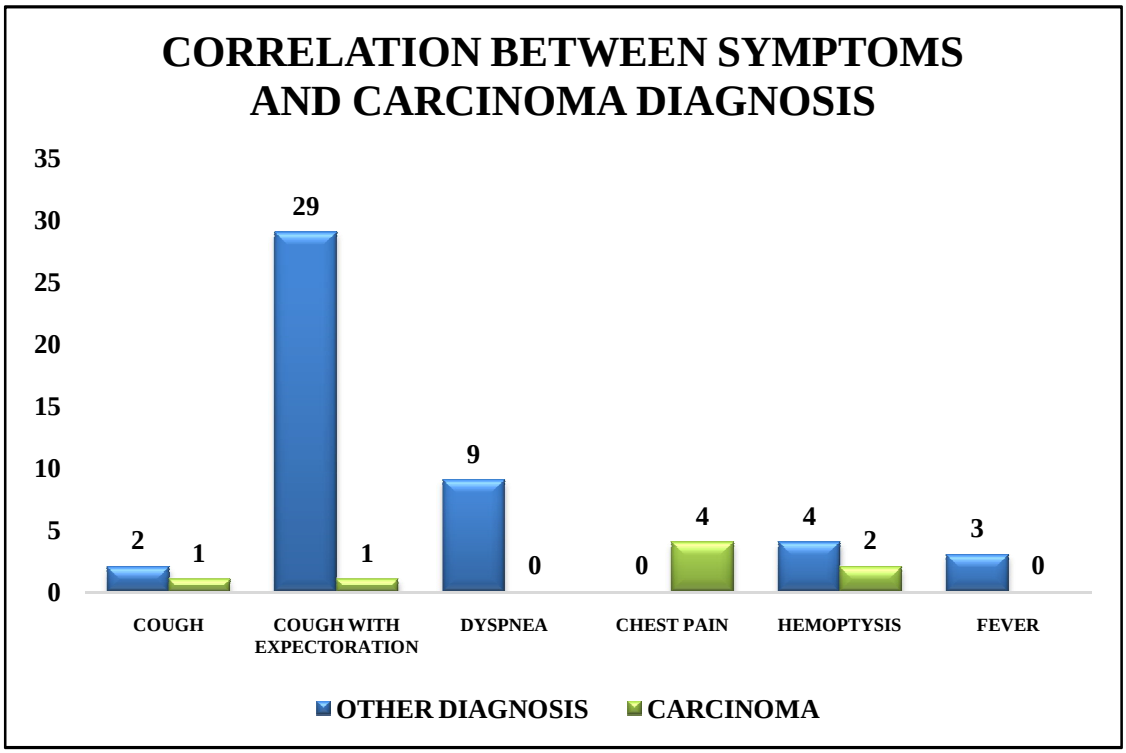



**Fig 31: Correlation Between Presenting Symptoms And Carcinoma Diagnosis**

## PRESENTING SYMPTOMS IN BACTERIAL PNEUMONIA:

Out of 55 patients in our study, in patients where bacterial pneumonia was diagnosed, the most common presenting symptom was cough with expectoration followed by fever in that order, with a P-value of 0.264

| CORRELATION BETWEEN SYMPTOMS AND BACTERIAL PNEUMONIA | | | | | |
|---|---|---|---|---|---|
| | | Bacterial pneumonia | | Total | Chi Square |
| | | Other diagnosis | Bacterial pneumonia | | P-Value |
| SYMPTOMS | Cough | 3 | 0 | 3 | 0.264 |
| | Cough With Expectoration | 23 | 7 | 30 | |
| | Dyspnea | 9 | 0 | 9 | |
| | Chest Pain | 4 | 0 | 4 | |
| | Hemoptysis | 6 | 0 | 6 | |
| | Fever | 2 | 1 | 3 | |
| Total | | 47 | 8 | 55 | |

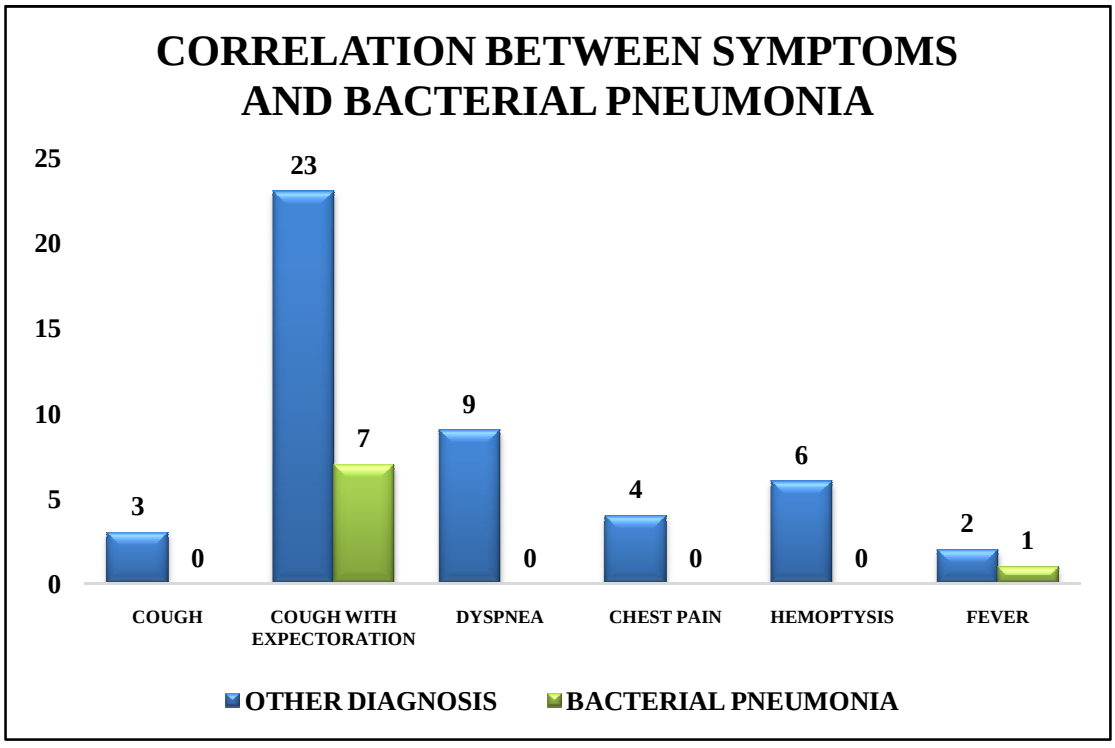



**Fig 32: Correlation Between Presenting Symptoms And Bacterial Pneumonia Diagnosis**

## SYMPTOM DURATION IN TUBERCULOSIS:

Out of 55 patients in our study, in those patients where tuberculosis was diagnosed the symptom duration in a majority of patients was 4-6 weeks and 6-8 weeks, followed by >8 weeks, **with a P-value of 0.000 which is statistically significant**.

| CORRELATION BETWEEN SYMPTOM DURATION AND TUBERCULOSIS DIAGNOSIS | | | | | |
|---|---|---|---|---|---|
| | | TB | | Total | Chi Square |
| | | Other Diagnosis | Tuberculosis | | P-Value |
| Symptom Duration | 4-6 Weeks | 11 | 10 | 21 | 0.000 |
| | 6-8 Weeks | 2 | 10 | 12 | |
| | >8 Weeks | 19 | 3 | 22 | |
| Total | | 32 | 23 | 55 | |

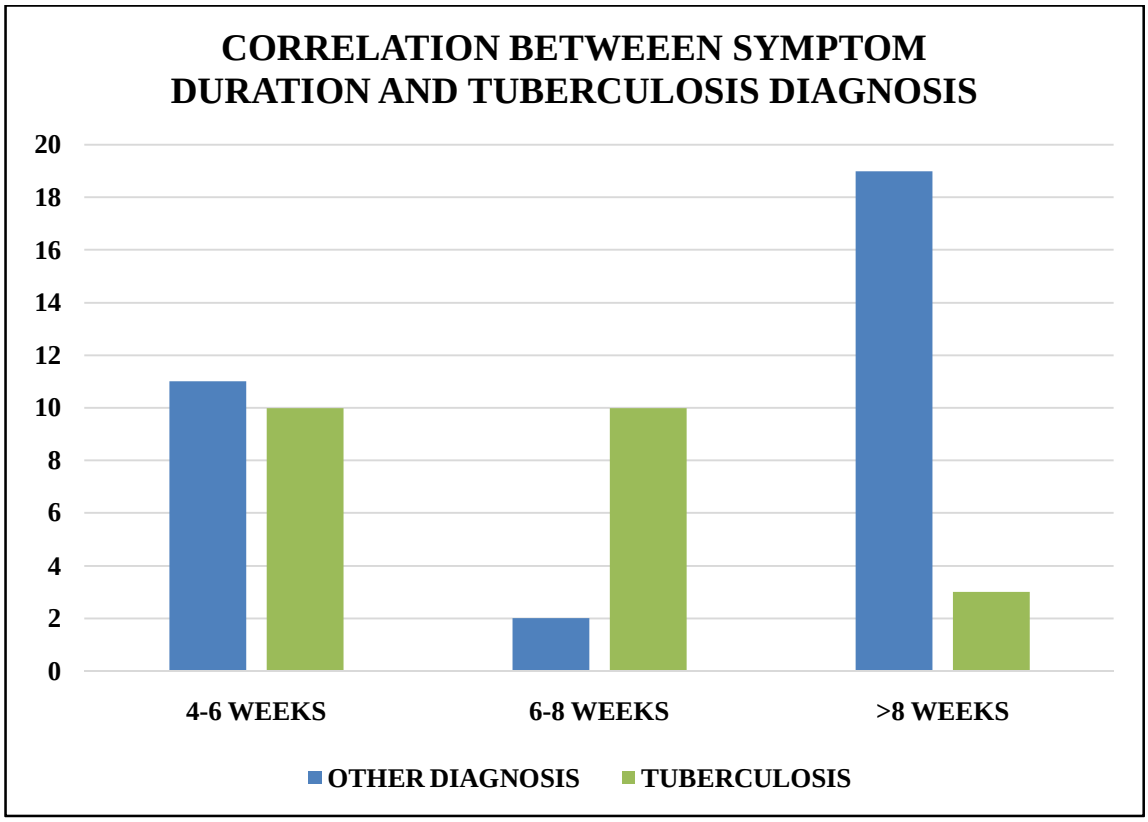



**Fig 33: Correlation Between Symptom Duration And Tuberculosis Diagnosis**

**SYMPTOM DURATION IN CARCINOMA:**

Out of 55 patients in our study, in those patients where carcinoma was diagnosed the symptom duration in a majority of patients was >8 weeks and 4-6 weeks with a P-value of 0.270

| CORRELATION BETWEEN SYMPTOM DURATION AND CARCINOMA DIAGNOSIS | | | | | |
|---|---|---|---|---|---|
| | | Carcinoma | | Total | Chi Square |
| | | Other diagnosis | Carcinoma | | P-Value |
| Symptom Duration | 4-6 Weeks | 17 | 4 | 21 | 0.270 |
| | 6-8 Weeks | 12 | 0 | 12 | |
| | >8 Weeks | 18 | 4 | 22 | |
| Total | | 47 | 8 | 55 | |

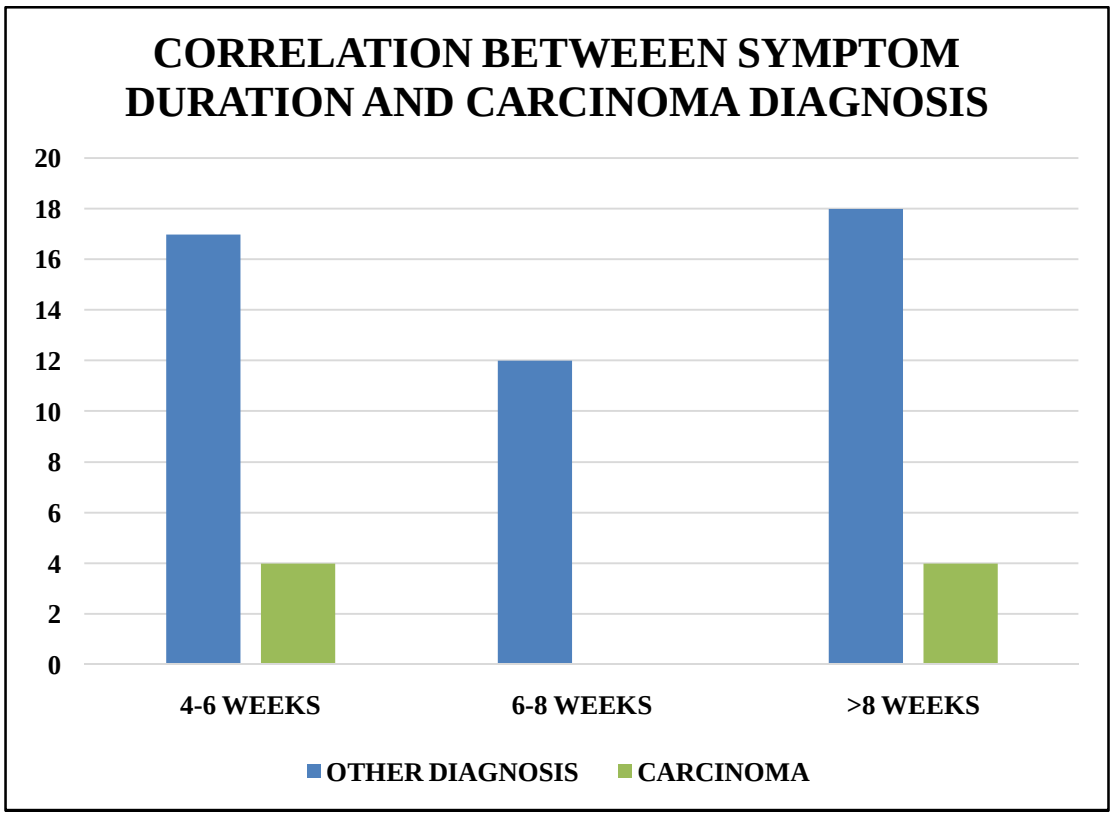



**Fig 34: Correlation Between Symptom Duration And Carcinoma Diagnosis**

## SYMPTOM DURATION IN BACTERIAL PNEUMONIA:

Out of 55 patients in our study, in those patients where bacterial pneumonia was diagnosed the symptom duration in a majority of patients was >8 weeks, and 4-6 weeks, with a P-value of 0.270

| CORRELATION BETWEEN SYMPTOM DURATION AND BACTERIAL PNEUMONIA | | | | | |
|---|---|---|---|---|---|
| | | Bacterial pneumonia | | Total | Chi Square |
| | | Other Diagnosis | Bacterial pneumonia | | P-Value |
| Symptom Duration | 4-6 Weeks | 17 | 4 | 21 | 0.270 |
| | 6-8 Weeks | 12 | 0 | 12 | |
| | >8 Weeks | 18 | 4 | 22 | |
| Total | | 47 | 8 | 55 | |

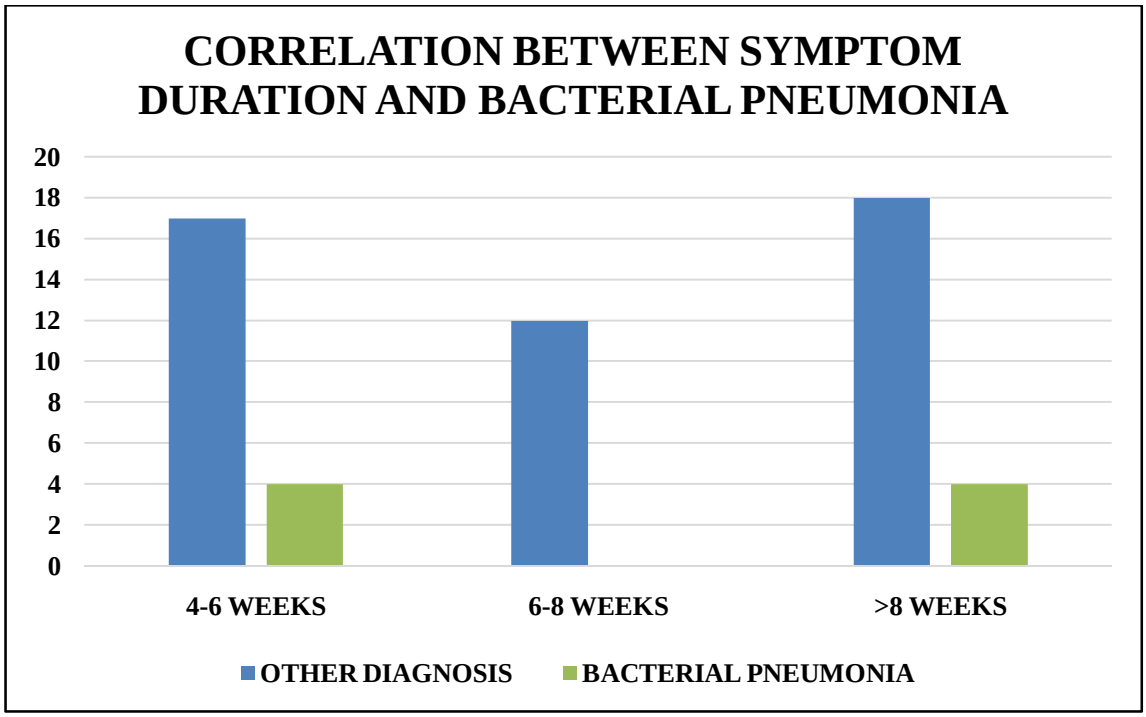



**Fig 35: Correlation Between Symptom Duration And Bacterial Pneumonia**

## CO MORBIDITIES IN TUBERCULOSIS:

Out of the 18 patients with DIABETES, 50% of them were diagnosed with TUBERCULOSIS **with a P-value of 0.024 which is statistically significant.**

| CORRELATION BETWEEN CO MORBIDITY AND TUBERCULOSIS DIAGNOSIS | | | | | |
|---|---|---|---|---|---|
| Co morbidity | | Tb | | Total | Chi Square |
| | | Other Diagnosis | Tuberculosis Diagnosis | | P-Value |
| Diabetes | No | 23 | 14 | 37 | 0.024 |
| | Yes | 9 | 9 | 18 | |
| COPD | No | 23 | 22 | 45 | 0.391 |
| | Yes | 9 | 1 | 10 | |
| Renal failure | No | 31 | 21 | 52 | 0.370 |
| | Yes | 1 | 2 | 3 | |
| Asthma | No | 30 | 23 | 53 | 0.222 |
| | Yes | 2 | 0 | 2 | |
| Anaemia | No | 31 | 21 | 52 | 0.370 |
| | Yes | 1 | 2 | 3 | |
| Others | No | 30 | 16 | 46 | 0.017 |
| | Yes | 2 | 7 | 9 | |
| Total | | 32 | 23 | 55 | |

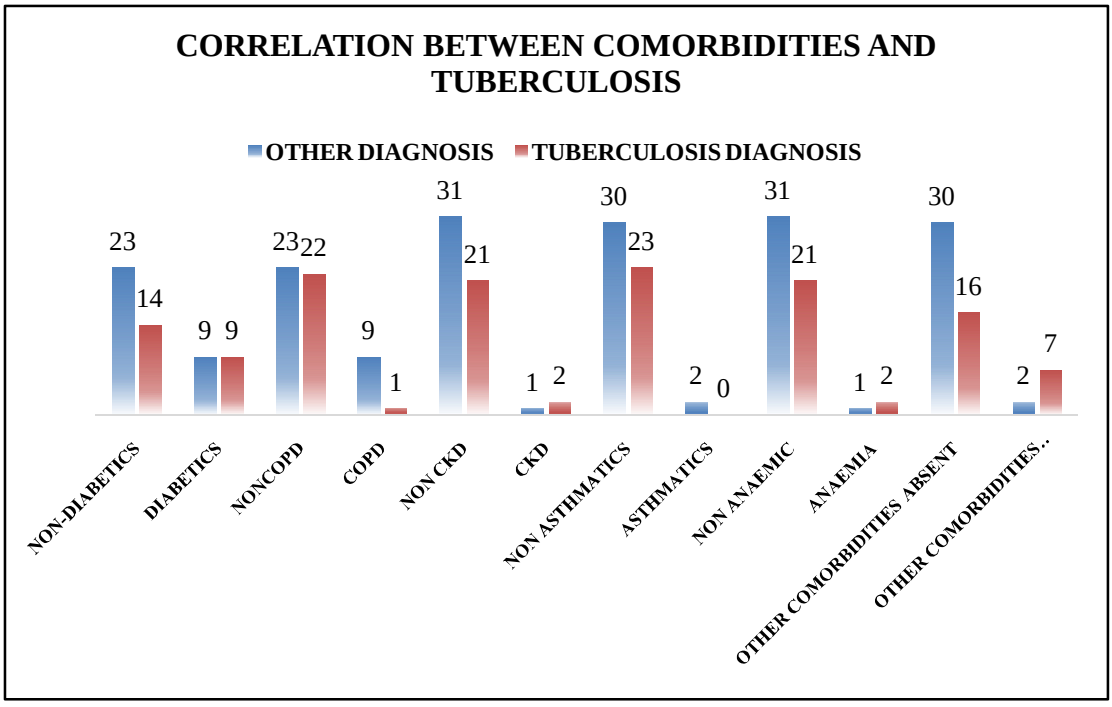



**Fig 36: correlation between co morbidities and tuberculosis diagnosis**

## CO MORBIDITIES IN CARCINOMA:

Out of the 10 patients with COPD, 50% of them were diagnosed with CARCINOMA **with a P-value of 0.000 which is statistically significant.**

| CORRELATION BETWEEN CO MORBIDITIES AND CARCINOMA DIAGNOSIS | | | | | |
|---|---|---|---|---|---|
| | | Carcinoma | | Total | Chi Square |
| | | Other diagnosis | Carcinoma | | P-Value |
| Diabetes | No | 30 | 7 | 37 | 0.187 |
| | Yes | 17 | 1 | 18 | |
| COPD | No | 42 | 3 | 45 | |
| | Yes | 5 | 5 | 10 | 0.000 |
| Renal failure | No | 44 | 8 | 52 | |
| | Yes | 3 | 0 | 3 | 0.462 |
| Asthma | No | 45 | 8 | 53 | |
| | Yes | 2 | 0 | 2 | 0.552 |
| Anaemia | No | 45 | 7 | 52 | |
| | Yes | 2 | 1 | 3 | 0.342 |
| Others | No | 38 | 8 | 46 | |
| | Yes | 9 | 0 | 9 | 0.176 |
| Total | | 47 | 8 | 55 | |

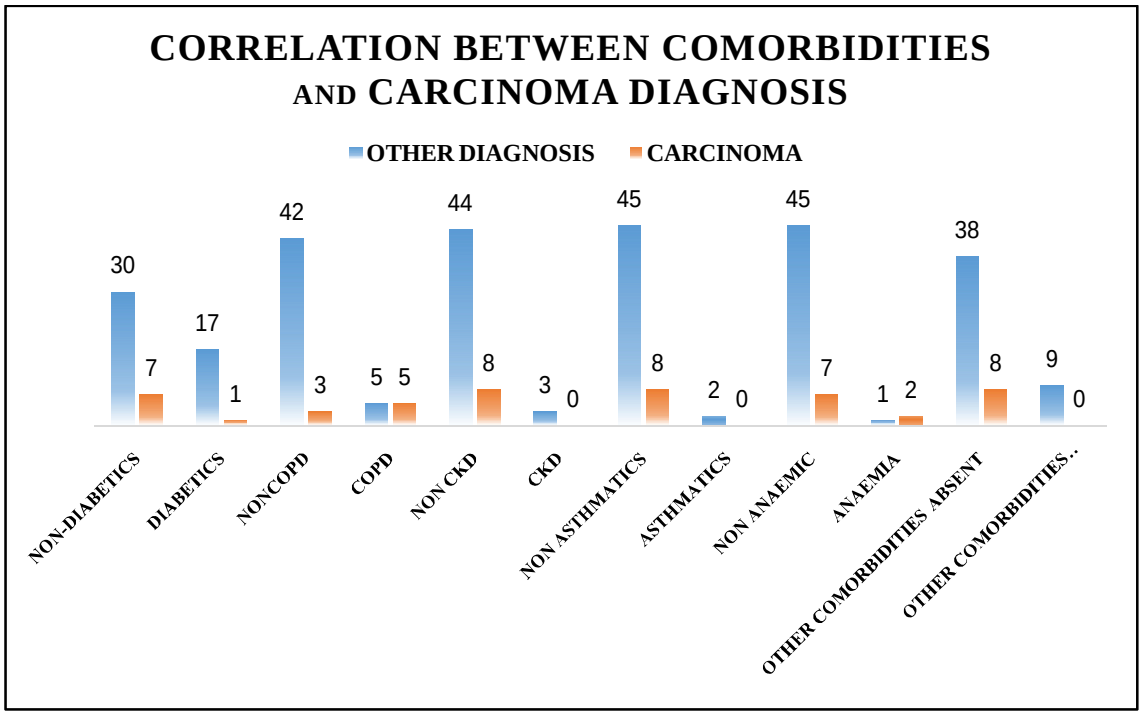



**Fig 37: Correlation Between Co Morbidities And Carcinoma Diagnosis**

## LOBES INVOLVED IN TUBERCULOSIS:

Out of 55 patients in our study, in patients where tuberculosis was diagnosed the most common lobe involved was left upper lobe followed by diffuse involvement, right upper lobe, right middle lobe and left lower lobe in that order, **with a P-value of 0.037 which is statistically significant.**

| CORRELATION BETWEEN LOBES INVOLVED AND TUBERCULOSIS DIAGNOSIS | | | | | |
|---|---|---|---|---|---|
| | | TB | | Total | Chi Square |
| | | Other Diagnosis | Tuberculosis | | P-Value |
| Lobes Involved | Left lower lobe | 5 | 2 | 7 | 0.037 |
| | Left upper lobe | 4 | 10 | 14 | |
| | Right lower lobe | 6 | 0 | 6 | |
| | Right middle lobe | 1 | 3 | 4 | |
| | Right upper lobe | 9 | 3 | 12 | |
| | Diffuse involvement | 7 | 5 | 12 | |
| Total | | 32 | 23 | 55 | |

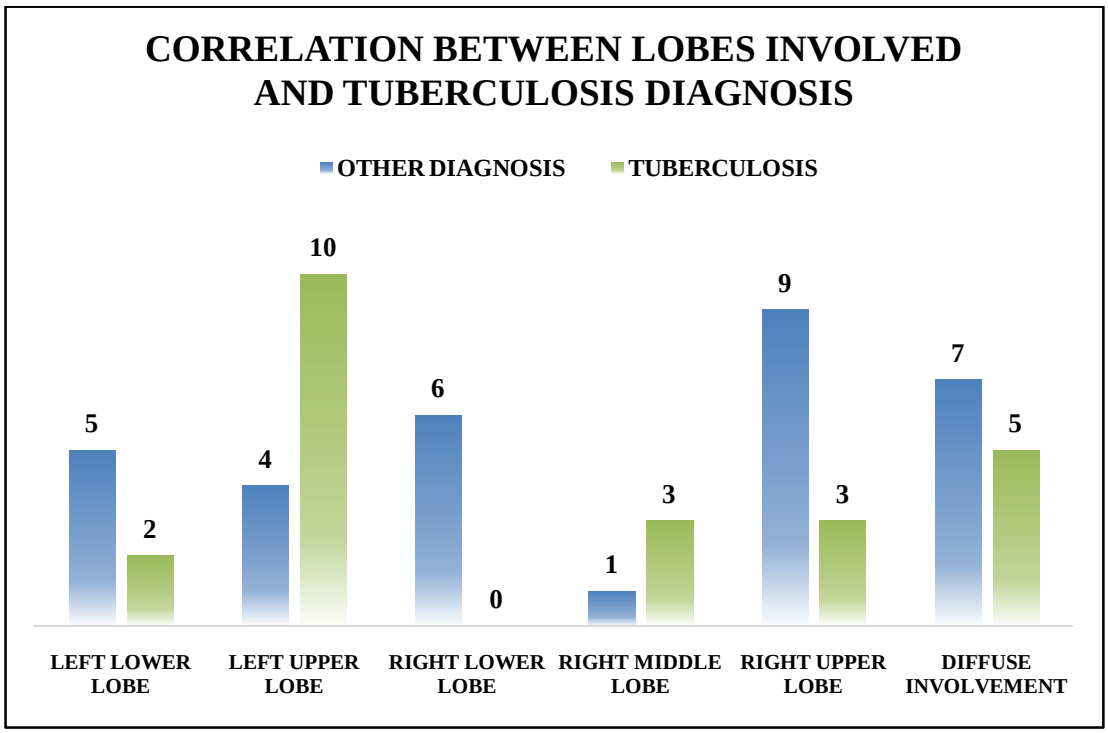



**Fig 38: Correlation Between Lobes Involved And Tuberculosis Diagnosis**

**LOBES INVOLVED IN CARCINOMA:**

Out of 55 patients in our study, in patients where carcinoma was diagnosed the most common lobe involved was right upper lobe, followed by left upper lobe, right lower lobe and left lower lobe in that order, with a P-value of 0.462

| CORRELATION BETWEEN LOBES INVOLVED AND CARCINOMA DIAGNOSIS | | | | | |
|---|---|---|---|---|---|
| | | Carcinoma | | Total | Chi Square |
| | | Other Diagnosis | Carcinoma | | P-Value |
| Lobes Involved | Left lower lobe | 6 | 1 | 7 | 0.462 |
| | Left upper lobe | 12 | 2 | 14 | |
| | Right lower lobe | 4 | 2 | 6 | |
| | Right middle lobe | 4 | 0 | 4 | |
| | Right upper lobe | 9 | 3 | 12 | |
| | Diffuse involvement | 12 | 0 | 12 | |
| Total | | 47 | 8 | 55 | |

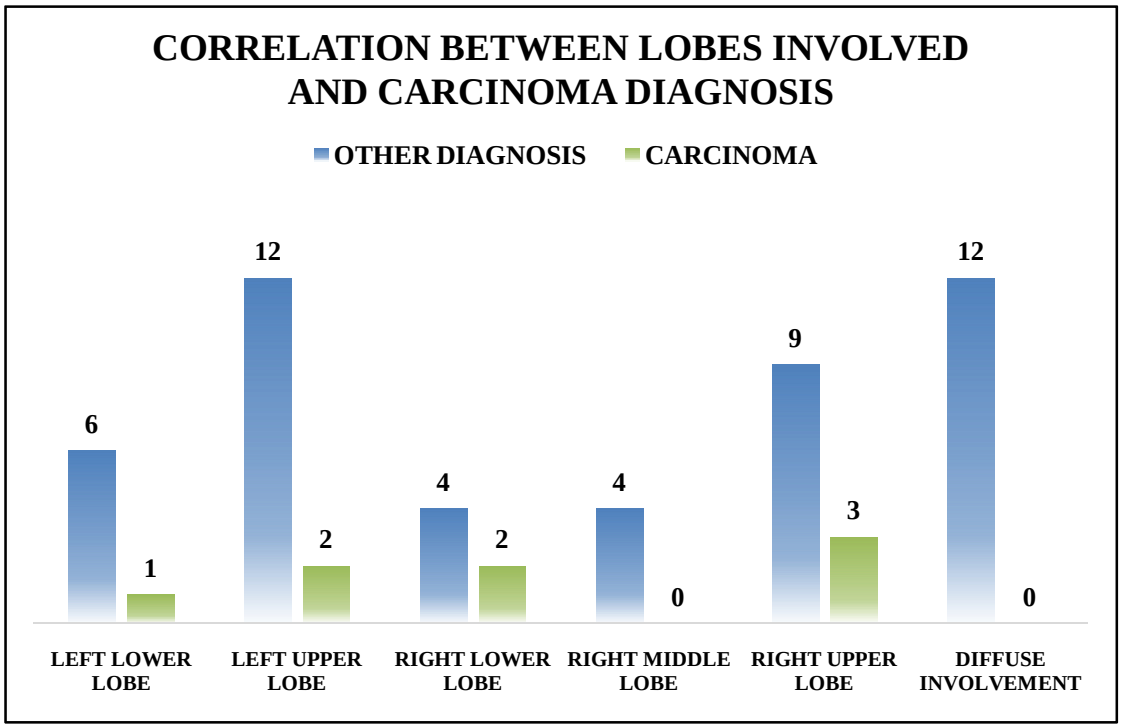



**Fig 39: Correlation Between Lobes Involved And Carcinoma Diagnosis**

**LOBES INVOLVED IN BACTERIAL PNEUMONIA:**

Out of 55 patients in our study, in patients where bacterial pneumonia was diagnosed the most common lobe involved was right upper lobe, followed by left lower lobe, right lower lobe and right middle lobe, in that order with a P-value of 0.157

| CORRELATION BETWEEN LOBES INVOLVED AND BACTERIAL PNEUMONIA DIAGNOSIS | | | | | |
|---|---|---|---|---|---|
| | | Bacterial pneumonia | | Total | Chi Square |
| | | Other Diagnosis | Bacterial Pneumonia | | P-Value |
| Lobes Involved | Left Lower Lobe | 5 | 2 | 7 | 0.157 |
| | Left Upper Lobe | 14 | 0 | 14 | |
| | Right Lower Lobe | 5 | 1 | 6 | |
| | Right Middle Lobe | 3 | 1 | 4 | |
| | Right Upper Lobe | 8 | 4 | 12 | |
| | Diffuse Involvement | 12 | 0 | 12 | |
| Total | | 47 | 8 | 55 | |

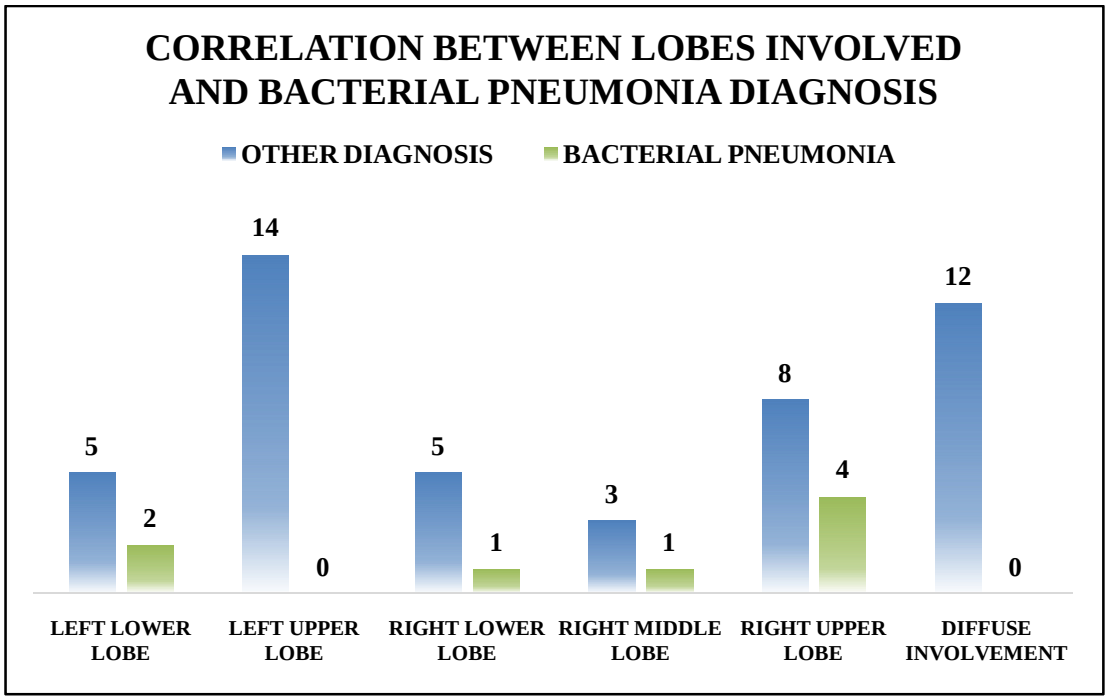



**Fig 40: Correlation Between Lobes Involved And Bacterial Pneumonia Diagnosis**

**FOB FINDINGS IN TUBERCULOSIS:**

Out of 55 patients in our study, in patients where tuberculosis was diagnosed the most common fob finding was purulent secretions, followed by mucosal inflammation, mucous plugging and blood stained secretions, **with a P-value of 0.031 which is statistically significant.**

| CORRELATION BETWEEN FOB FINDINGS AND TUBERCULOSIS DIAGNOSIS | | | | | |
|---|---|---|---|---|---|
| | | TB | | Total | Chi Square |
| | | Other Diagnosis | Tuberculosis | | P-Value |
| Fob Findings | Blood Stained Secretions | 2 | 1 | 3 | 0.031 |
| | Intraluminal Granulation Tissue/Mass | 5 | 0 | 5 | |
| | Mucosal Inflammation | 15 | 6 | 21 | |
| | Mucous Plugging | 0 | 2 | 2 | |
| | Purulent Secretions | 10 | 14 | 24 | |
| Total | | 32 | 23 | 55 | |

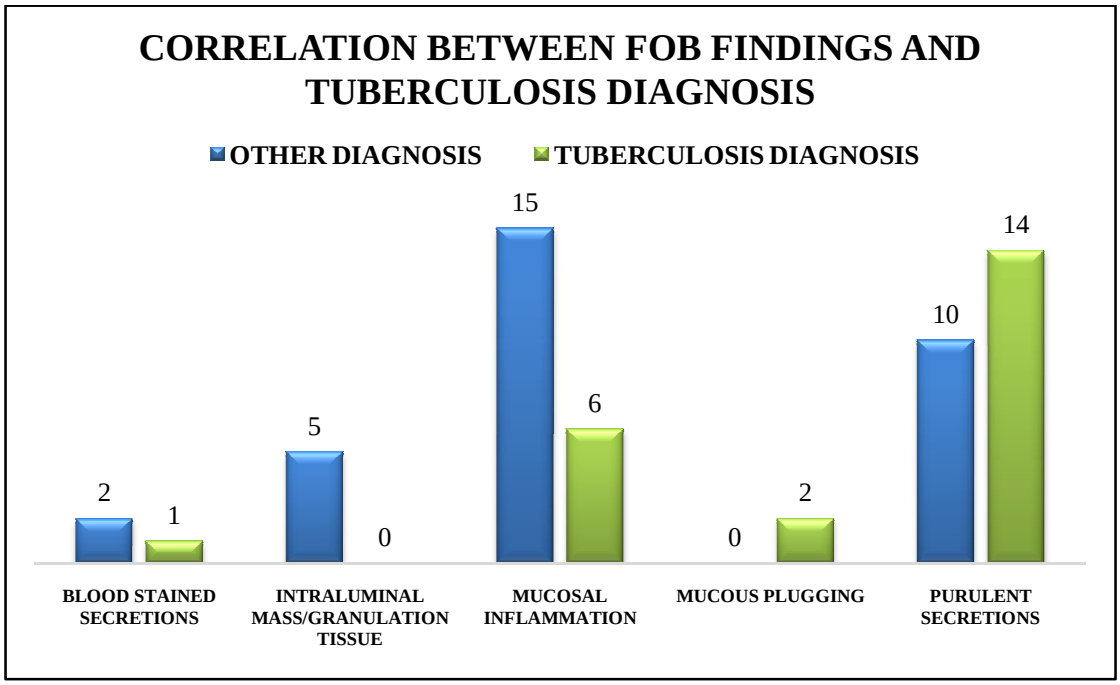



**Fig 41: Correlation Between Fob Findings And Tuberculosis Diagnosis**

## FOB FINDINGS IN CARCINOMA:

Out of 55 patients in our study, in patients where carcinoma was diagnosed the most common fob finding was intraluminal mass followed by mucosal inflammation, **with a P-value of 0.000 which is statistically significant.**

| CORRELATION BETWEEN FOB FINDINGS AND CARCINOMA DIAGNOSIS | | | | | |
|---|---|---|---|---|---|
| | | Carcinoma | | Total | Chi square |
| | | Other Diagnosis | Carcinoma | | P-value |
| Fob Findings | Blood stained secretions | 3 | 0 | 3 | 0.000 |
| | Intraluminal granulation tissue/mass | 0 | 5 | 5 | |
| | Mucosal inflammation | 18 | 3 | 21 | |
| | Mucous plugging | 2 | 0 | 2 | |
| | Purulent secretions | 24 | 0 | 24 | |
| TOTAL | | 47 | 8 | 55 | |

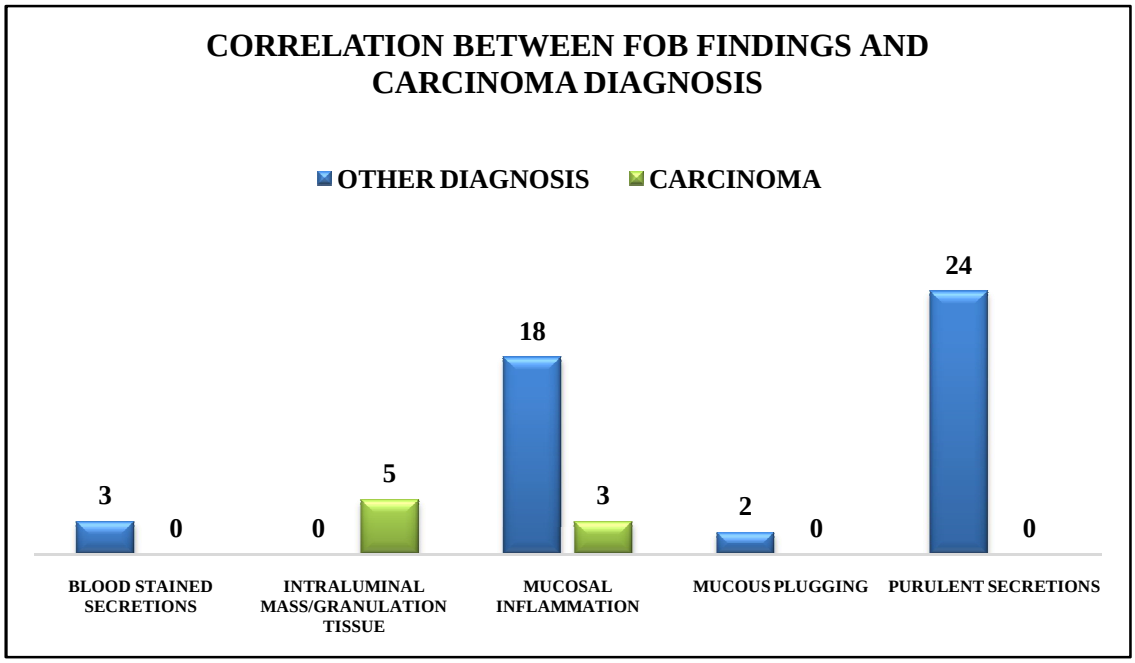



**Fig 42: Correlation Between Fob Findings And Carcinoma Diagnosis**

## FOB FINDINGS IN BACTERIAL PNEUMONIA:

Out of 55 patients in our study, in patients where bacterial pneumonia was diagnosed the most common fob finding was purulent secretions, followed by mucosal inflammation, with a P-value of 0.114

| CORRELATION BETWEEN FOB FINDINGS AND BACTERIAL PNEUMONIA | | | | | |
|---|---|---|---|---|---|
| | | Bacterial pneumonia | | Total | Chi Square |
| | | Other diagnosis | Bacterial pneumonia | | P-Value |
| Fob Findings | Blood Stained Secretions | 3 | 0 | 3 | 0.114 |
| | Intraluminal Granulation Tissue/Mass | 5 | 0 | 5 | |
| | Mucosal Inflammation | 20 | 1 | 21 | |
| | Mucous plugging | 2 | 0 | 2 | |
| | Purulent secretions | 17 | 7 | 24 | |
| Total | | 47 | 8 | 55 | |

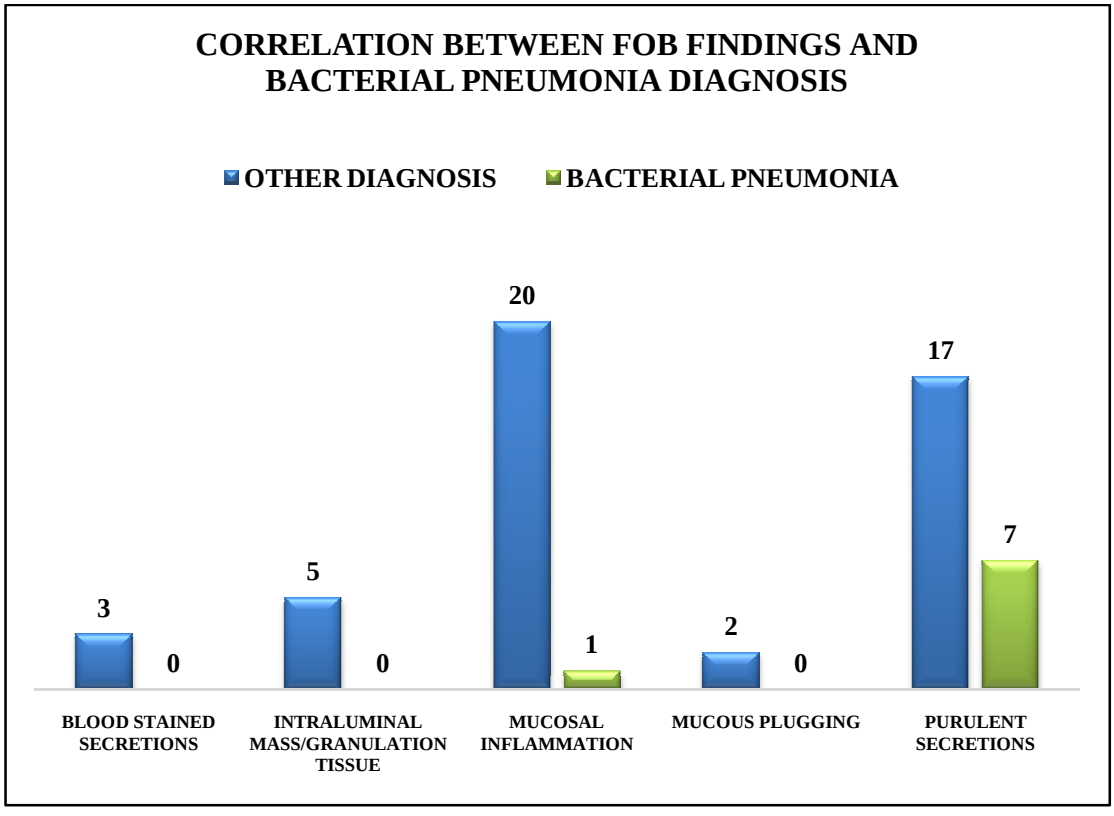



**Fig 43: Correlation Between Fob Findings And Bacterial Pneumonia**

## SMOKING INDEX AND CARCINOMA:

Out of 55 patients, in 8 patients where carcinoma was diagnosed, 5 of them were heavy smokers, with a P-value of 0.097

| CORRELATION BETWEEN SMOKING INDEX AND CARCINOMA | | | | | |
|---|---|---|---|---|---|
| | | Carcinoma | | | Chi Square |
| | | Other diagnosis | Carcinoma | Total | P-Value |
| SMOKING INDEX | MODERATE SMOKER (101 to 300) | 8 | 0 | 8 | 0.097 |
| | HEAVY SMOKER (>300) | 13 | 5 | 18 | |
| Total | | 21 | 5 | 26 | |

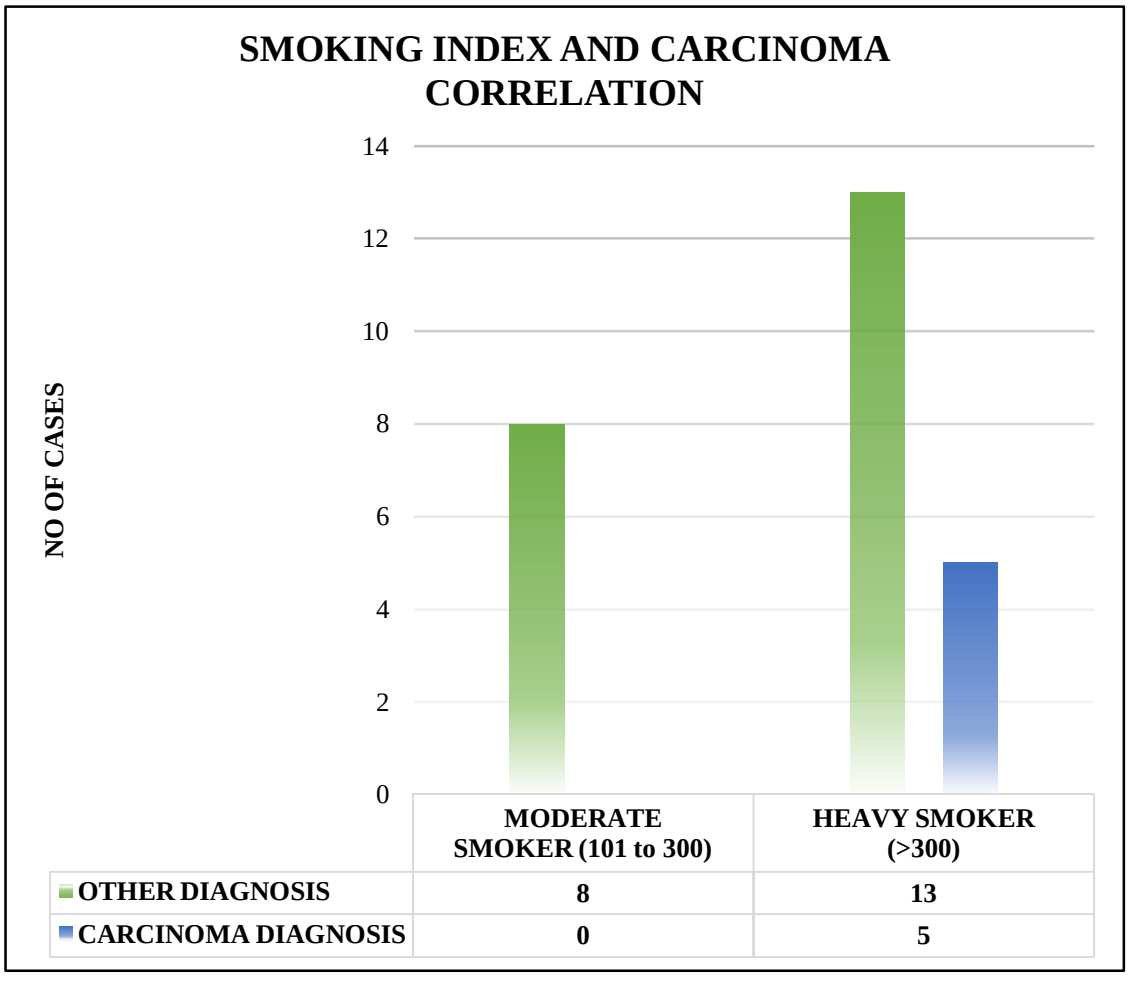



**Fig 44: Correlation Between Smoking Index And Carcinoma**

## CORRELATION BETWEEN BRONCHIAL WASH GENE XPERT AND BRONCHIAL WASH AFB SMEAR:

In 23 patients where gene xpert was positive (MTB DETECTED), Bronchial wash AFB SMEAR was positive in 12 patients and there was no extra yield with Bronchial wash AFB SMEAR when Bronchial wash GENE XPERT is used, **with a P-value of 0.000 which is statistically significant.**

| CORRELATION BETWEEN BRONCHIAL WASH GENE XPERT AND AFB SMEAR | | | | | |
|---|---|---|---|---|---|
| | | AFB smear | | Total | Chi Square |
| | | Negative | Positive | | P-Value |
| Gene Xpert | MTB not detected | 32 | 0 | 32 | 0.000 |
| | MTB detected | 11 | 12 | 23 | |
| Total | | 43 | 12 | 55 | |

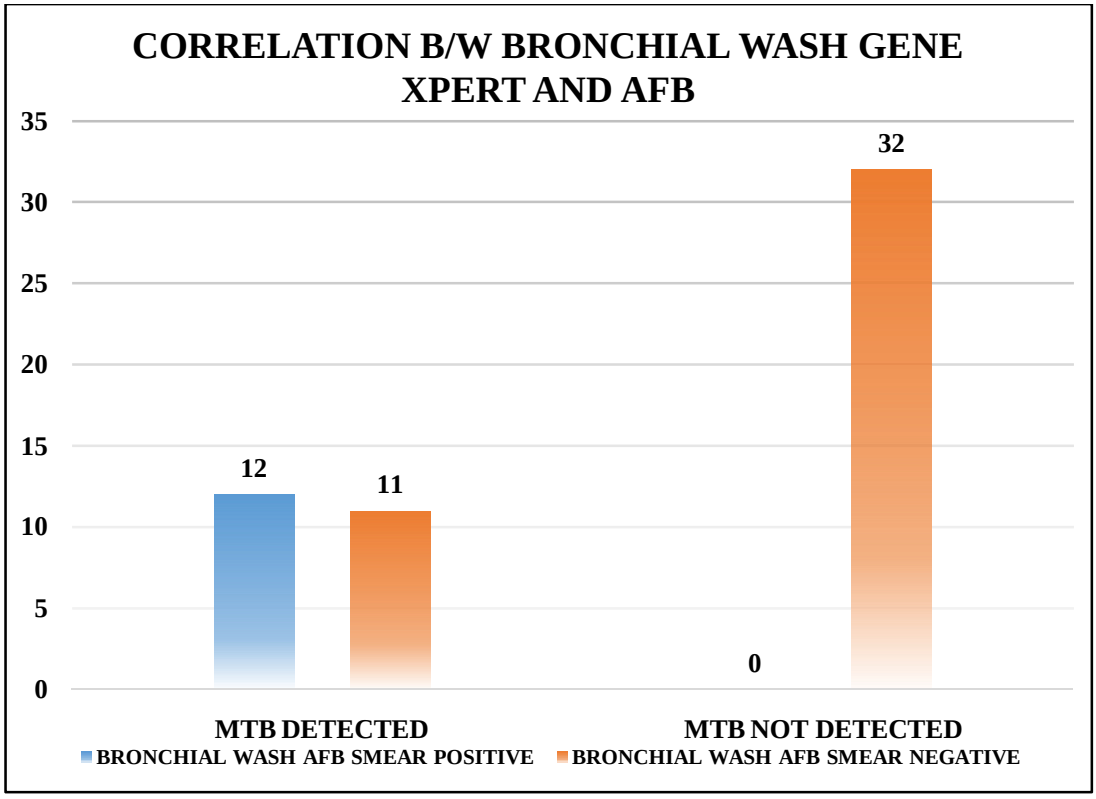



**Fig 45: Correlation Between Bronchial Wash Gene Xpert And AFB Smear**

**CORRELATION BETWEEN BRONCHIAL WASH GENE XPERT AND POST FOB SPUTUM AFB SMEAR:**

In 23 patients where Bronchial wash gene xpert was positive (MTB DETECTED), POST FOB SPUTUM AFB SMEAR was positive in 4 patients and there was no extra yield with POST FOB SPUTUM AFB SMEAR when Bronchial wash GENE XPERT is used, **with a P-value of 0.014 which is statistically significant.**

| CORRELATION BETWEEN BRONCHIAL WASH GENE XPERT AND POST FOB SPUTUM AFB SMEAR | | | | | |
|---|---|---|---|---|---|
| | | POST FOB SPUTUM AFB SMEAR | | Total | Chi Square |
| | | POSITIVE | NEGATIVE | | P-Value |
| GENE XPERT | MTB NOT DETECTED | 0 | 32 | 32 | |
| | MTB DETECTED | 4 | 19 | 23 | 0.014 |
| Total | | 4 | 51 | 55 | |

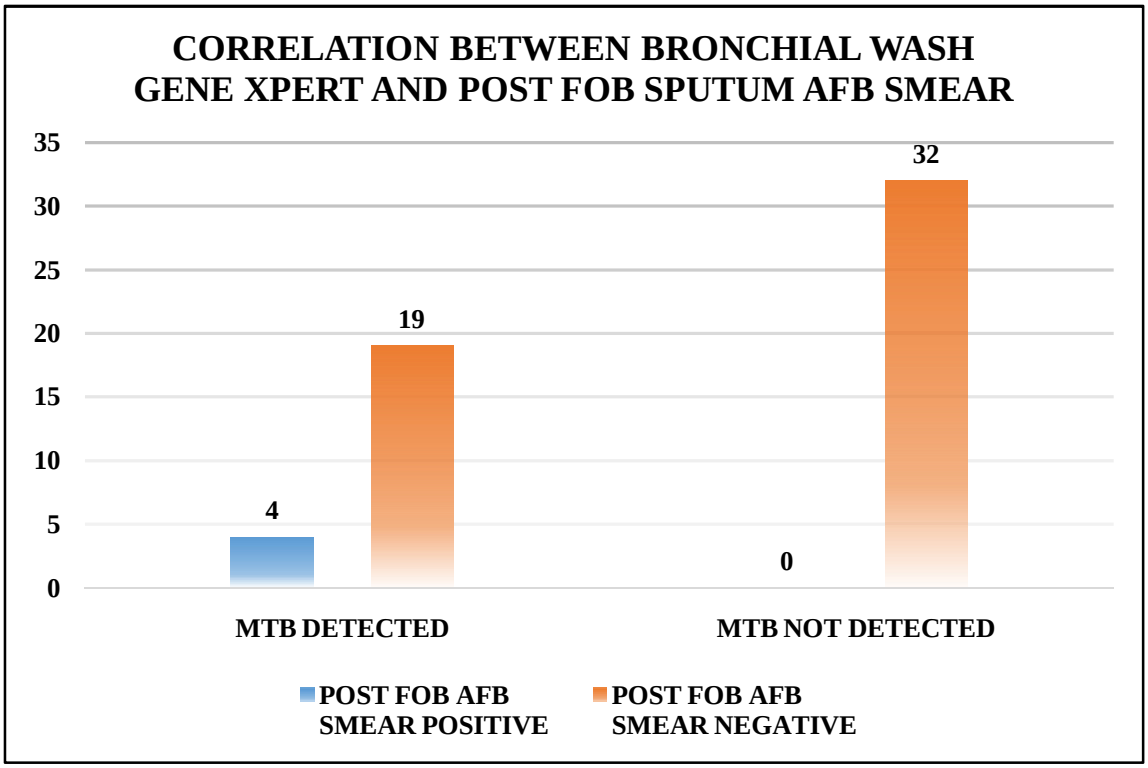



**Fig 46: Correlation Between Bronchial Wash Gene Xpert And Post Fob Sputum AFB Smear**

## CORRELATION BETWEEN BRONCHIAL WASH AFB SMEAR AND POST FOB SPUTUM AFB SMEAR:

In 12 patients where Bronchial wash AFB SMEAR was positive, POST FOB SPUTUM AFB SMEAR was positive in 4 patients and there was no extra yield with POST FOB SPUTUM AFB SMEAR when Bronchial wash AFB SMEAR is used, **with a P-value of 0.000 which is statistically significant.**

| CORRELATION B/W BRONCHIAL WASH AFB AND POST FOB SPUTUM AFB SMEAR | | | | | |
|---|---|---|---|---|---|
| | | Post fob Sputum AFB smear | | Total | Chi Square |
| | | Positive | Negative | | P-Value |
| Bronchial wash AFB smear | Negative | 0 | 43 | 43 | 0.000 |
| | Positive | 4 | 8 | 12 | |
| Total | | 4 | 51 | 55 | |

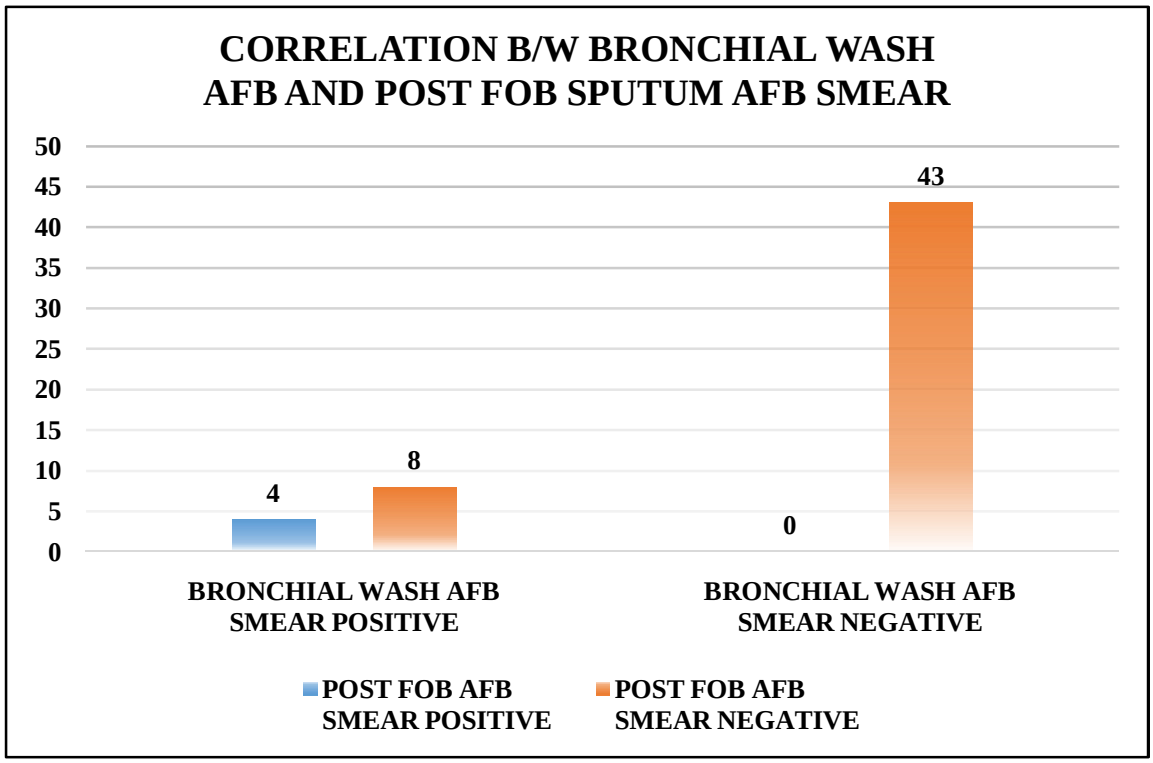



**Fig 47: Correlation Between Bronchial Wash AFB Smear And Post Fob Sputum AFB Smear**

# DISCUSSION

## AGE DISTRIBUTION:

A total number of 55 patients who satisfied the inclusion and exclusion criteria were included in our study. The mean age of the total 55 patients was 49.3 years with a standard deviation of 12.5. The age of the patients ranged from 20 years-69 years. The percentage of the patients belonging to the 5 age groups namely <30 years, 31-40 years, 41-50 years, 51-60 years and >60 years were 10.9%, 10.9%, 23.6%, 38.2% and 16.4% respectively.

## GENDER DISTRIBUTION:

Out of the total 55 patients, 44 patients were males and 11 patients were females. Thus males accounted for 80% of our study population while females accounted for 20%.

## PATIENT'S EDUCATIONAL STATUS:

In our study, out of 55 patients 49.1% were illiterate and 18.2% completed primary school, 10.9% completed middle school, 7.3% completed high school, 9.1% completed higher secondary school, 1.8% completed diploma and 3.6% completed post graduate degree diploma.

## GROSS TOTAL INCOME PER DAY:

The gross total income of the family in our study was less than or equal to 250 Rupees in 28 patients, 251-500 Rupees in 18 patients and 501-1000 Rupees in 9 patients.

## PRESENTING SYMPTOMS:

The presenting symptom of the patients in our study was cough with expectoration in 54.5% of patients, dyspnea in 16.4%, hemoptysis in 10.9%, chest pain in 7.3%, dry cough in 5.5% and fever in 5.5%.

## DURATION OF SYMPTOMS:

The duration of symptoms in our study were divided into 3 groups namely 4-6 weeks, 6-8 weeks and >8 weeks. 22 of our patients had a symptom duration of >8 weeks, 21 patients had a symptom duration of 4-6 weeks and 12 patients had a symptom duration of 6-8 weeks. Our study suggests that majority of the patients 22 in number, it took >8 weeks to label them as non-resolving pneumonia and it took further time to diagnose the cause. Further if the patient was diagnosed to have tuberculosis he/she would have remained infectious throughout the whole period, and if malignancy is diagnosed the staging of the malignancy will go up from bad to worse during that period.

## PAST HISTORY OF RESPIRATORY ILLNESS:

Among 55 patients in our study 65.5% patients had no prior respiratory illness and 34.5% had a past history of respiratory illness.

## SMOKING STATUS OF STUDY POPULATION

Out of 55 patients in our study, 47.3% were smokers, 52.7% were non-smokers. None of the female patients were smokers. Out of the smokers, 31% were moderate smokers, 69% were heavy smokers.

## HISTORY OF ALCOHOL CONSUMPTION IN STUDY POPULATION:

Out of 55 patients in our study, 54.5% patients had a history of chronic alcohol intake. 45.5% patients were non-alcoholics. None of the female patients in our study were alcoholics.

## CO MORBIDITIES :

Out of the 55 patients in our study, 45 patients had a history of co morbid disease. 10 patients had no history of any co morbidities . Among the patients with co morbidities , diabetes was present in 40%, COPD in 22.22%, renal failure in 6.67%, anaemia in 6.67%, bronchial asthma in 4.44% and other co morbidities in 20%.

## AUSCULTATORY FINDING:

Of the total 55 patients in our study, crackles was the most common auscultatory finding in 80%, wheeze in 14.5% and diminished breath sounds in 5.5%.

## LOBES INVOLVED:

In our study the lobes involved in the patients were assessed using a computed tomography chest. Left upper lobe was involved in 25.4%, right upper lobe in 21.8%, diffuse involvement again in 21.8%, left lower lobe in 12.7% , right lower lobe in 10.9%, and right middle lobe in 7.3%.

## BRONCHOSCOPY FINDINGS:

Out of 55 patients in our study the most common bronchoscopic finding was purulent secretions in 43.6%, mucosal inflammation in 38.2%, intraluminal mass/granulation tissue in 9.1%, blood stained secretions in 5.5 and mucous plugging in 3.6%.

## BRONCHIAL WASH GENE XPERT:

Out of 55 patients, in our study Bronchial wash Gene Xpert had a result of MTB DETECTED in 41.8% and MTB NOT DETECTED in 58.2%.

## GENE XPERT RIFAMPICIN RESISTANCE:

Out of 23 patients in whom MTB DETECTED all 23 patients had a result of RIFAMPICIN RESISTANCE-NOT DETECTED.

## BRONCHIAL WASH AFB SMEAR:

Out of 55 patients in our study Bronchial wash AFB smear was positive in 21.8% and negative in 78.2%.

## BRONCHIAL WASH BACTERIAL CULTURE:

Out of the total 55 patients in our study, Bronchial wash BACTERIAL CULTURE was contributory in arriving at a diagnosis in 14.5% of patients (n=8). The 8 Bronchial wash CULTURE SENSITIVITY results that are contributory to the diagnosis are ACINETOBACTER, E.COLI, KLEBSIELLA PNEUMONIAE, NOCARDIA SPECIES, PSEUDOMONAS AERUGINOSA, PROTEUS MIRABILIS, PROTEUS VULGARIS and ACTINOMYCETES.

## BRONCHIAL WASH CYTOLOGY REPORTS:

Out of the total 55 patients in our study a cytology report of acute inflammatory pathology was obtained in 54.5% of patients, chronic inflammatory pathology in 32.7% of patients and atypical cells seen(positive for malignancy) in 12.7% of patients.

## BRONCHIAL WASH FUNGAL SMEAR/CULTURE:

Out of the 55 patients in our study none had a positive fungal smear/culture.

## ENDOBRONCHIAL BIOPSY:

Out of the 55 patients in our study, endobronchial biopsy was done in 6 patients and was contributory to the diagnosis in all 6 of them. 4 cases were diagnosed as carcinoma, 1 as carcinoid tumor and 1 as fungal pneumonia (mucormycosis).

## TRANSBRONCHIAL LUNG BIOPSY (TBLB):

Out of the 55 patients in our study, TBLB was done in 3 patients and it was contributory to diagnosis in all 3 patients. 1 case was diagnosed as BOOP, 1 as Chronic HSP (bird fanciers lung) and 1 actinomycetes pneumonia.

## CT-GUIDED BIOPSY:

Out of the 55 patients in our study, CT-GUIDED BIOPSY was done in 4 patients and it was contributory to diagnosis in all 4 patients. 3 cases were diagnosed as carcinoma and 1 as lipoid pneumonia.

**POST FOB SPUTUM AFB SMEAR:**

Out of 55 patients in our study, POST FOB SPUTUM AFB SMEAR was done in all 55 patients and it was positive and contributory to the diagnosis in 4 patients.

**POST FOB SPUTUM CYTOLOGY:**

Out of the 55 patients in our study, POST FOB SPUTUM CYTOLOGY was done in all 55 patients and it was contributory in diagnosing the cause of NRP in 4 patients.

**ETIOLOGY DIAGNOSED:**

Out of the 55 patients in our study, etiology of NRP was diagnosed in 92.7% (n=51) of patients and not diagnosed in 7.3% (n=4) of patients. TUBERCULOSIS (n=23), BACTERIAL PNEUMONIA (n=8), CARCINOMA INCLUDING ONE MALIGNANT CARCINOID TUMOR (n=8), ALLERGIC BRONCHOPULMONARY ASPERGILLOSIS (n=2), CHRONIC HYPERSENSITIVITY PNEUMONITIS (n=2), SILICOSIS (n=3), SLE PNEUMONITIS (n=1), BRONCHIOLITIS OBLITERANS ORGANISING PNEUMONIA(BOOP) (n=1), FUNGAL PNEUMONIA (MUCOR) (n=1) , DAH WITH PULMONARY RENAL SYNDROME (n=1), LIPOID PNEUMONIA (n=1) and UNDIAGNOSED (n=4).

**AGE DISTRIBUTION IN TUBERCULOSIS:**

Out of 55 patients in our study, in patients where tuberculosis was diagnosed the most common age group affected was 50-60 years, followed by 41-50 years, >60 years, <30 years and 31-40 years in that order, with a P-value of 0.504

**AGE DISTRIBUTION IN CARCINOMA:**

Out of 55 patients in our study, in patients where carcinoma was diagnosed the most common age group affected was 51-60 years, followed by >60 years, 41-50 years and <30 years in that order with a P-value of 0.680

**AGE DISTRIBUTION IN BACTERIAL PNEUMONIA:**

Out of 55 patients in our study, in patients where bacterial pneumonia was diagnosed the most common age group affected was 41-50 years, followed by >60 years, 51-60 years and 31-40 years in that order with a P-value of 0.211

**PRESENTING SYMPTOMS IN TUBERCULOSIS:**

Out of 55 patients in our study, in patients where tuberculosis was diagnosed, the most common presenting symptom was cough with expectoration, followed by hemoptysis, cough, dyspnea and fever in that order, with a P-value of 0.09

## PRESENTING SYMPTOMS IN CARCINOMA:

Out of 55 patients in our study, in patients where carcinoma was diagnosed, the most common presenting symptom was chest pain, followed by hemoptysis, cough with expectoration and cough in that order, **with a P-value of 0.000 which is statistically significant.**

## PRESENTING SYMPTOMS IN BACTERIAL PNEUMONIA:

Out of 55 patients in our study, in patients where bacterial pneumonia was diagnosed, the most common presenting symptom was cough with expectoration followed by fever in that order, with a P-value of 0.264

## SYMPTOM DURATION IN TUBERCULOSIS:

Out of 55 patients in our study, in those patients where tuberculosis was diagnosed the symptom duration in a majority of patients was 4-6 weeks and 6-8 weeks, followed by >8 weeks, **with a P-value of 0.000 which is statistically significant.**

## SYMPTOM DURATION IN CARCINOMA:

Out of 55 patients in our study, in those patients where carcinoma was diagnosed the symptom duration in a majority of patients was >8 weeks and 4-6 weeks with a P-value of 0.270

## SYMPTOM DURATION IN BACTERIAL PNEUMONIA:

Out of 55 patients in our study, in those patients where bacterial pneumonia was diagnosed the symptom duration in a majority of patients was >8 weeks, and 4-6 weeks, with a P-value of 0.270

## DIABETES AND TUBERCULOSIS:

Out of the 18 patients with DIABETES, 50% of them were diagnosed with TUBERCULOSIS **with a P-value of 0.024 which is statistically significant.**

## COPD AND CARCINOMA:

Out of the 10 patients with COPD, 50%(n=5) of them were diagnosed with CARCINOMA **with a P-value of 0.000 which is statistically significant.**

## LOBES INVOLVED IN TUBERCULOSIS:

Out of 55 patients in our study, in patients where tuberculosis was diagnosed the most common lobe involved was left upper lobe followed by diffuse involvement, right upper lobe, right middle lobe and left lower lobe in that order, **with a P-value of 0.037 which is statistically significant.**

## LOBES INVOLVED IN CARCINOMA:

Out of 55 patients in our study, in patients where carcinoma was diagnosed the most common lobe involved was right upper lobe, followed by left upper lobe, right lower lobe and left lower lobe in that order, with a P-value of 0.462

## LOBES INVOLVED IN BACTERIAL PNEUMONIA:

Out of 55 patients in our study, in patients where bacterial pneumonia was diagnosed the most common lobe involved was right upper lobe, followed by left lower lobe, right lower lobe and right middle lobe, in that order with a P-value of 0.157

## FOB FINDINGS IN TUBERCULOSIS:

Out of 55 patients in our study, in patients where tuberculosis was diagnosed the most common fob finding was purulent secretions, followed by mucosal inflammation, mucous plugging and blood stained secretions, **with a P-value of 0.031 which is statistically significant.**

## FOB FINDINGS IN CARCINOMA:

Out of 55 patients in our study, in patients where carcinoma was diagnosed the most common fob finding was intraluminal mass followed by mucosal inflammation, **with a P-value of 0.000 which is statistically significant.**

## FOB FINDINGS IN BACTERIAL PNEUMONIA:

Out of 55 patients in our study, in patients where bacterial pneumonia was diagnosed the most common fob finding was purulent secretions, followed by mucosal inflammation, with a P-value of 0.114

**SMOKING AND CARCINOMA:**

Out of 55 patients, in 8 patients where carcinoma was diagnosed, 5 of them were heavy smokers, with a P-value of 0.097

**BRONCHIAL WASH GENE XPERT Vs BRONCHIAL WASH AFB SMEAR:**

In 23 patients where Bronchial wash gene xpert was positive (MTB DETECTED), Bronchial wash AFB SMEAR was positive in 12 patients and there was no extra yield with Bronchial wash AFB SMEAR when Bronchial wash GENE XPERT is used, **with a P-value of 0.000 which is statistically significant.**

**BRONCHIAL WASH GENE XPERT Vs POST FOB SPUTUM AFB SMEAR:**

In 23 patients where Bronchial wash gene xpert was positive (MTB DETECTED), POST FOB SPUTUM AFB SMEAR was positive in 4 patients and there was no extra yield with POST FOB SPUTUM AFB SMEAR when Bronchial wash GENE XPERT is used**, with a P-value of 0.014 which is statistically significant.**

**BRONCHIAL WASH AFB SMEAR Vs POST FOB SPUTUM AFB SMEAR:**

In 12 patients where Bronchial wash AFB SMEAR was positive, POST FOB SPUTUM AFB SMEAR was positive in 4 patients and there was no extra yield with POST FOB SPUTUM AFB SMEAR when Bronchial wash AFB SMEAR is used, **with a P-value of 0.000 which is statistically significant.**

# CONCLUSION

1. **Non-resolving pneumonia was observed to be more common in patients >40 years of age which constitutes around 80% of study population.**
2. **In our study it was observed that Non-resolving pneumonia was more common in males compared to females with the ratio of 4:1.**
3. **Majority of the patients in our study were from low income group and illiterates.**
4. **The most common presenting symptom was persistent cough with expectoration.**
5. **Chest pain followed by hemoptysis were the presenting symptoms when cause for non-resolving pneumonia was diagnosed as malignancy.**
6. **Almost all of the patients in our study had a symptom duration of at least 4 weeks which implies health seeking behaviour of patients is not satisfactory (or) these patients were referred late to our institution. Hence, patients should be referred early to tertiary care units for evaluation, once non-resolving pneumonia is suspected.**
7. **Smoking and alcoholism was found to be associated with non-resolving pneumonia in 47% patients and 55% patients respectively.**

8. **Non resolving pneumonia was found to be associated with co morbidities in around 80% of our study population. Diabetes mellitus (40%) and COPD (22%) were the most common co morbidities.**
9. **Non resolving pneumonia in diabetic patients is more likely to be tuberculosis with 50% of diabetics in our study were diagnosed with tuberculosis.**
10. **Non resolving pneumonia in COPD patients, is an ominous sign, more chances of it being diagnosed as malignancy.**
11. **Bronchoscopy was found to be a safe and useful procedure in non-resolving pneumonia patients and no serious complications were encountered. The diagnostic yield of bronchoscopy in our study was 71%.**
12. **Tuberculosis was the most common cause for non-resolving pneumonia in around 42% of patients. Bacterial pneumonia (15%) and malignancy (15%) were the next two causes.**
13. **Bronchial wash Gene Xpert, as a single investigation has a diagnostic yield of around 42% in non-resolving pneumonia.**
14. **Bronchial wash Gene Xpert has an additional yield of 48% in diagnosing tuberculosis against Bronchial wash AFB smear.**
15. **Bronchial wash Gene Xpert has an additional yield of 83% in diagnosing tuberculosis against Post Bronchoscopy sputum AFB smear.**

16. **Our study suggests that Bronchial wash Gene Xpert can be included in the non-resolving pneumonia investigation panel, because it has a good diagnostic yield and provides an early diagnosis of tuberculosis before the patient becomes bronchial wash AFB or sputum AFB smear positive.**
17. **Early bronchoscopy (after 2 weeks of antibiotics), is needed in non-resolving pneumonia for early diagnosis of tuberculosis.**

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## ABBREVIATIONS

| | | |
|---|---|---|
| COPD | – | Chronic Obstructive Pulmonary Disease |
| MTB | – | Mycobacterium tuberculosis |
| HIV | – | Human Immunodeficiency Virus |
| FOB | – | Fiber optic bronchoscopy |
| HAP | – | Hospital Acquired Pneumonia |
| VAP | – | Ventilator Associated Pneumonia |
| CB NAAT | – | Cartridge Based Nucleic Acid Amplification Test |
| HSP | – | Hyper Sensitivity Pneumonitis |
| SLE pneumonitis | – | Systemic Lupus Erythematosus pneumonitis |
| ABPA | – | Allergic Broncho Pulmonary Aspergillosis |
| BOOP | – | Bronchiolitis Obliterans Organising Pneumonia |
| DAH | – | Diffuse Alveolar Haemorrhage |
| AFB | – | Acid Fast Bacilli |
| PCP | – | Pneumocystis Carinii Pneumonia |
| CAD | – | Coronary Artery Disease |
| NTM | – | Non Tuberculous Mycobacteria |
| AIDS | – | Acquired Immune Deficiency Syndrome |
| MRSA | – | Methcillin Resistant Staphylococcus Aureus |

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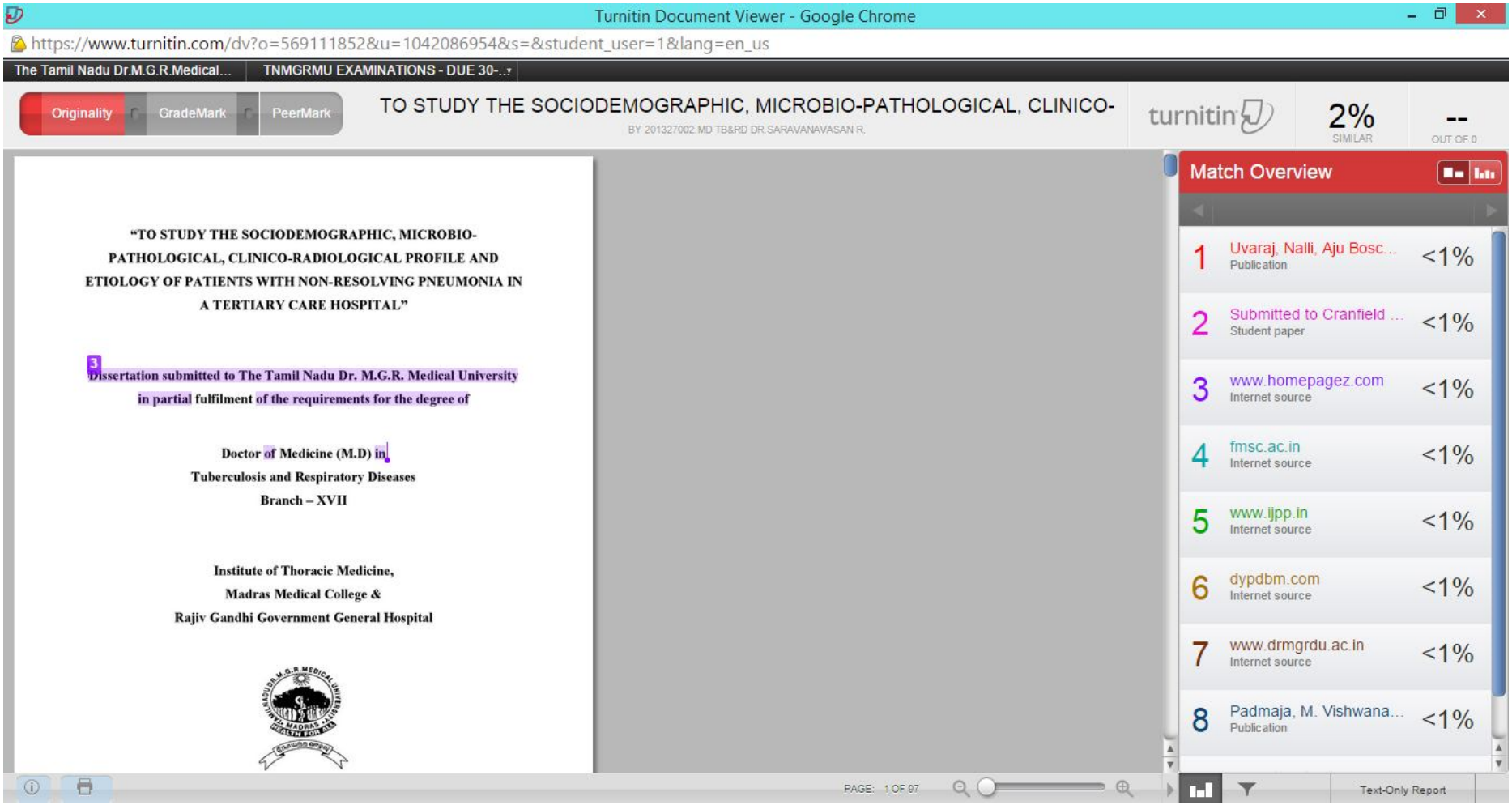
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Dissertation submitted to The Tamil Nadu Dr. M.G.R. Medical University in partial fulfilment of the requirements for the degree of
Doctor of Medicine (M.D) in
Tuberculosis and Respiratory Diseases
Branch – XVII
Institute of Thoracic Medicine,
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"TO STUDY THE SOCIODEMOGRAPHIC, MICROBIOLOGICAL, CLINICO-RADIOLOGICAL PROFILE AND ETIOLOGY OF PATIENTS WITH NON-RESOLVING PNEUMONIA IN A TERTIARY CARE HOSPITAL"

Dissertation submitted to The Tamil Nadu Dr. M.G.R. Medical University in partial fulfillment of the requirements for the degree of

Doctor of Medicine (M.D.) in Tuberculosis and Respiratory Diseases Branch – XX-D

Institute of Thoracic Medicine, Madras Medical College & Rajiv Gandhi Government General Hospital

The Tamil Nadu Dr. M.G.R. Medical University Chennai – 600032 Tamil Nadu India April 2014

# INSTITUTIONAL ETHICS COMMITTEE
# MADRAS MEDICAL COLLEGE, CHENNAI 600 003

EC Reg.No.ECR/270/Inst./TN/2013
Telephone No.044 25305301
Fax: 011 25363970

## CERTIFICATE OF APPROVAL

To

Dr.Saravanavasan.R.
II Year PG in MD (TB & RD)
Institute of Thoracic Medicine
Madras Medical College
Chennai 600 003

Dear Dr.Saravanavasan.R.,

The Institutional Ethics Committee has considered your request and approved your study titled **"TO STUDY THE SOCIODEMOGRAPHIC, MICROBIO-PATHOLOGICAL, CLINICO-RADIOLOGICAL PROFILE AND ETIOLOGY OF PATIENTS WITH NON-RESOLVING PNEUMONIA IN A TERTIARY CARE HOSPITAL "** NO.22022015.

The following members of Ethics Committee were present in the meeting hold on 03.02.2015 conducted at Madras Medical College, Chennai 3.

1. Dr.C.Rajendran, MD :Chairperson
2. Dr.R.Vimala,MD.,Dean,MMC,Ch-3 : Deputy Chairperson
3. Prof.B.Kalaiselvi,MD.,Vice Principal,MMC,Ch-3 : Member Secretary
4. Prof.R.Nandhini,MD.,Inst.of Pharmacology,MMC : Member
5. Prof.P.Ragumani, MS., Professor, Inst.of Surgery,MMC : Member
6. Prof.K.Ramadevi, Director , Inst.of Bio-Chem.MMC : Member
7. Prof.Saraswathy,MD.,Director,Pathology, MMC : Member
8. Prof.Md.Ali, MD., DM.,Prof.&HOD of Medl.GE,MD.MMC: Member
9. Prof.S.G.Sivachidambaram,Director I/c, Inst.of Internal Medicine : Member
10. Thiru S.Rameshkumar : Lay Person
11. Thiru S.Govindasamy, BA., BL., : Lawyer
12. Tmt.Arnold Saulina, MA., MSW., : Social Scientist

We approve the proposal to be conducted in its presented form.

The Institutional Ethics Committee expects to be informed about the progress of the study and SAE occurring in the course of the study, any changes in the protocol and patients information/informed consent and asks to be provided a copy of the final report.

Member Secretary, Ethics Committee
INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE
CHENNAI-600 003

Sys 2

# PATIENT INFORMATION SHEET

**TITLE OF THE STUDY**: "To study the socio-demographic, microbio-pathological, clinico-radiological profile and etiology of patients with non-resolving pneumonia in a tertiary care hospital"

We are conducting a study on among patients admitted in Rajiv Gandhi Government General Hospital, Chennai.

The purpose of this study is to analyze **the socio-demographic, microbio-pathological and clinico-radiological profile and etiology of patients with non-resolving pneumonia in a tertiary care hospital.**

We are selecting cases based on diagnosis of non-resolving pneumonia as per the definition and the selected patients will undergo basic blood investigations, CT chest(if needed),fiber-optic bronchoscopy and CT guided biopsy(if necessary)to arrive at a diagnosis and subsequently treat the patient.

The privacy of the patients in the research will be maintained throughout the study. In the event of any publication or presentation resulting from the research, no personally identifiable information will be shared.

Taking part in this study is voluntary. You are free to decide whether to participate in this study or to withdraw at any time; your decision will not result in any loss of benefits to which you are otherwise entitled.

The results of the special study may be intimated to you at the end of the study period or during the study if anything is found abnormal which may aid in the management or treatment.

Signature of Investigator Signature of Participant

Date :

# PATIENT CONSENT FORM

| | | |
|---|---|---|
| Study Detail | : | "To study the socio-demographic, microbio-pathological, clinico-radiological profile and etiology of patients with non-resolving pneumonia in a tertiary care hospital " |
| Study Centre | : | Rajiv Gandhi Government General Hospital, Chennai. |
| Patient's Name | : | |
| Patient's Age | : | |
| Identification Number | : | |

Patient may check (√) these boxes

a) I confirm that I have understood the purpose of procedure for the above study. I have the opportunity to ask question and all my questions and doubts have been answered to my complete satisfaction. ☐

b) I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving reason, without my legal rights being affected. ☐

c) I understand that sponsor of the clinical study, others working on the sponsor's behalf, the ethical committee and the regulatory authorities will not need my permission to look at my health records, both in respect of current study and any further research that may be conducted in relation to it, even if I withdraw from the study I agree to this access. However, I understand that my identity will not be revealed in any information released to third parties or published, unless as required under the law. I agree not to restrict the use of any data or results that arise from this study. ☐

d) I agree to take part in the above study and to comply with the instructions given during the study and faithfully cooperate with the study team and to immediately inform the study staff if I suffer from any deterioration in my health or well-being or any unexpected or unusual symptoms. ☐

e) I hereby consent to participate in this study. ☐

f) I hereby give permission to undergo detailed clinical examination, Radiographs, blood investigations and surgical procedure as required. ☐

| | |
|---|---|
| Signature of Investigator | Signature of Participant |
| Date &time : | Name and address |
| Place : | |

# ஆராய்ச்சி ஒப்புதல் படிவம்

ஆராயச்சியின் தலைப்பு

**ஒரு மேல் சிகிச்சை மையத்தில் மெதுவாக குணமாகும் அல்லது குணமாக மறுக்கும் நிமோனியா காய்ச்சலுடன் அனுமதிக்கப்படும் நோயாளிகளின் சமூகம் சார்ந்த நுண்ணுயிர் மற்றும் நோய்க்குறி நூல் சார்ந்த மருத்துவ மற்றும் நெஞ்சுப்படம் சார்ந்த காரணிகளை ஆராய்தல் மற்றும் நோய்க்கான காரணத்தை கண்டறிதல்**

ஆய்வு நிலையம் : நெஞ்சக நோய் மருத்துவத் துறை.
சென்னை மருத்துவக் கல்லூரி சென்னை - 3.

பங்கு பெறுவரின் பெயர் :

பங்குபெறுபவரின் எண் :

**பங்குபெறுபவர் இதனை (✓) குறிக்கவும்**

மேலே குறிப்பிட்டுள்ள மருத்துவ ஆய்வின் விவரங்கள் எனக்கு விளக்கப்பட்டது. என்னுடைய சந்தேகங்களை கேட்கவும், அதற்கான தகுந்த விளக்கங்களை பெறவும் வாய்ப்பளிக்கப்பட்டது. ☐

நான் இவ்வாய்வில் தன்னிச்சையாகதான் பங்கேற்கிறேன். எந்த காரணத்தினாலோ எந்த கட்டத்திலும் எந்த சட்ட சிக்கலுக்கும் உட்படாமல் நான் இவ்வாய்வில் இருந்து விலகி கொள்ளலாம் என்றும் அறிந்து கொண்டேன். ☐

இந்த ஆய்வு சம்பந்தமாகவோ. இதை சார்ந்த மேலும் ஆய்வு மேற்கொள்ளும் போதும் இந்த ஆய்வில் பங்குபெறும் மருத்துவர் என்னுடைய மருத்துவ அறிக்கைகளை பார்ப்பதற்கு என் அனுமதி தேவையில்லை என அறிந்து கொள்கிறேன். நான் ஆய்வில் இருந்து விலகிக் கொண்டாலும் இது பொருந்தும் என அறிகிறேன். ☐

இந்த ஆய்வின் மூலம் கிடைக்கும் தகவல்களையும், பரிசோதனை முடிவுகளையும் மற்றும் சிகிச்சை தொடர்பான தகவல்களையும் மருத்துவர் மேற்கொள்ளும் ஆய்வில் பயன்படுத்திக்கொள்ளவும் அதை பிரசுரிக்கவும் என் முழு மனதுடன் சம்மதிக்கின்றேன். ☐

இந்த ஆய்வில் பங்கு கொள்ள ஒப்புக்கொள்கிறேன். எனக்கு கொடுக்கப்பட்ட அறிவுரைகளின்படி நடந்து கொள்வதுடன் இந்த ஆய்வை மேற்கொள்ளும் மருத்துவ அணிக்கு உண்மையுடன் இருப்பேன் என்று உறுதியளிகிறேன். ☐

பங்கேற்பவரின் கையொப்பம் ..... இடம்..... தேதி.....

கட்டைவிரல் ரேகை

பங்கேற்பவரின் பெயர் மற்றும் விலாசம் .....

ஆய்வாளரின் கையொப்பம் ..... இடம்..... தேதி.....

ஆய்வாளரின் பெயர் .....

**நன்மைகள்**

இந்த பரிசோதனைகளின் முடிவுகளை வைத்து நோய்க்கான காரணம் கண்டறியப்பட்டு தக்க சிகிச்சை அளிக்க முடியும்.

இந்த முறையான ஆய்வு ஏற்கனவே பல இடங்களில் நடத்தப்பட்டுள்ளது. மேலும் இதன் பாதுகாப்பு உறுதிசெய்யப்பட்டுள்ளது. நீங்கள் இந்த ஆய்வில் பங்குகொள்ள விரும்பவில்லை என்றால் எப்போதும் உபயோகிக்கப்படும் மருந்தே கொடுக்கப்படும். உங்கள் பாதுகாப்பே எங்களின் முக்கிய நோக்கம்.

இந்த ஆய்வு சம்பந்தமான எல்லா புள்ளி விவரங்கள் மற்றும் நோயாளிகளின் விவரங்கள் ரகசியமாக வைக்கப்படும். இந்த ஆய்வு சம்பந்தப்பட்ட எல்லா பரிசோதனைகள், மருந்துகள் மற்றும் மருத்துவ சேவைகள் அனைத்தும் நோயாளிகளுக்கு இலவசமாக வழங்கப்படும்.

**ஆய்வாளரின் பெயர்** **பங்குபெறுபவரின் பெயர்**

ஆய்வாளரின் கையொப்பம் பங்குபெறுபவரின் கையொப்பம்

# EVALUATION FORM

Name:

Age:

Sex:

ID/IP number:

Ward:

Socio-demographic history:

Presenting complaints:

History of presenting illness:

Past history:

Treatment history:

Personal history:

Occupational history:

General examination:

Systemic examination:

Blood investigations:

Chest skiagram:

CT-CHEST:

Sputum investigations:

Bronchoscopy findings and investigation results:

Trans bronchial/CT guided biopsy reports:

Final diagnosis:

| ID | NAME | AGE | GENDER | EDUCATION OF HEAD OF FAMILY | OCCUPATION OF HEAD OF FAMILY | GROSS TOTAL INCOME PER DAY | PRESENTING COMPLAINTS | DURATION IN WEEKS |
|---|---|---|---|---|---|---|---|---|
| 1 | SANTHAIYAH | 55 | M | UNEDUCATED | COOLIE | 450 | COUGH WITH EXPECTORATION | 5 |
| 2 | GANESAN | 63 | M | HIGH SCHOOL | COOK | 650 | COUGH WITH EXPECTORATION | 10 |
| 3 | CHINNAPAIYAN | 65 | M | UNEDUCATED | COOLIE | 300 | CHEST PAIN | 10 |
| 4 | GAJENDRAN | 50 | M | PRIMARY SCHOOL | COOLIE | 350 | COUGH WITH EXPECTORATION | 7 |
| 5 | AROKIYA SAMY | 63 | M | UNEDUCATED | COOLIE | 400 | HEMOPTYSIS | 5 |
| 6 | MOHANAPRIYA | 27 | F | PRIMARY SCHOOL | CLERICAL | 750 | COUGH WITH EXPECTORATION | 7 |
| 7 | PANKAJAVALLI | 59 | F | PRIMARY SCHOOL | COOLIE | 400 | COUGH WITH EXPECTORATION | 7 |
| 8 | CENSAPPAN | 67 | M | UNEDUCATED | FARMER | 250 | CHEST PAIN | 10 |
| 9 | SURESHKUMAR | 36 | M | SECONDARY SCHOOL | SKILLED WORK | 700 | COUGH WITH EXPECTORATION | 5 |
| 10 | MADHAIYAN | 69 | M | UNEDUCATED | FARMER | 200 | COUGH WITH EXPECTORATION | 5 |
| 11 | GOPAL | 46 | M | UNEDUCATED | COOLIE | 300 | COUGH WITH EXPECTORATION | 7 |
| 12 | ELUMALAI | 25 | M | POST HIGH SCHOOL DIPLOMA | CLERICAL | 700 | COUGH WITH EXPECTORATION | 5 |
| 13 | ABDUL AZIZ | 57 | M | HIGH SCHOOL | SEMI PROFESSION | 800 | COUGH WITH EXPECTORATION | 5 |
| 14 | KANAGA | 45 | F | UNEDUCATED | FARMER | 250 | DYSPNEA | 10 |
| 15 | GOPINATHAN | 22 | M | HIGHER SECONDARY | SHOP OWNER | 800 | FEVER | 7 |
| 16 | RAVI | 52 | M | MIDDLE SCHOOL | FARMER | 300 | CHEST PAIN | 10 |
| 17 | NEELAGANDAN | 53 | M | HIGHER SECONDARY | CLERICAL | 850 | COUGH WITH EXPECTORATION | 5 |
| 18 | EMMAROSE | 62 | M | MIDDLE SCHOOL | FARMER | 250 | COUGH WITH EXPECTORATION | 5 |
| 19 | RAJENDRAN | 42 | M | HIGHER SECONDARY | FARMER | 300 | COUGH WITH EXPECTORATION | 7 |
| 20 | DHANAPAL | 63 | M | UNEDUCATED | FARMER | 250 | COUGH WITH EXPECTORATION | 10 |
| 21 | SIVAKUMAR | 35 | M | POSTGRADUATE DIPLOMA | OFFICE JOB | 1000 | HEMOPTYSIS | 5 |
| 22 | DHANAM | 48 | F | UNEDUCATED | FARMER | 300 | COUGH WITH EXPECTORATION | 5 |
| 23 | GANESAN | 60 | M | UNEDUCATED | COOLIE | 250 | DYSPNEA | 10 |
| 24 | RENUGA | 50 | F | PRIMARY SCHOOL | FARMER | 200 | COUGH | 10 |
| 25 | RAGAIAH | 50 | M | UNEDUCATED | COOLIE | 200 | COUGH WITHEXPECTORATION | 10 |
| 26 | SRINIVASAN | 63 | M | UNEDUCATED | FARMER | 150 | COUGH WITH EXPECTORATION | 7 |
| 27 | KALIYAPERUMAL | 55 | M | PRIMARY SCHOOL | COOLIE | 200 | FEVER | 5 |
| 28 | RAVICHANDRAN | 53 | M | UNEDUCATED | COOLIE | 300 | COUGH WITH EXPECTORATION | 7 |
| 29 | ARAVINDASAMY | 20 | M | HIGH SCHOOL | FARMER | 150 | COUGH WITH EXPECTORATION | 10 |
| 30 | PERUMAL | 63 | M | UNEDUCATED | COOLIE | 200 | DYSPNEA | 10 |

| ID | NAME | PREVIOUS H/O RESP ILLNESS | SMOKER | SMOKING INDEX | ALCOHOLISM | CO MORBIDITIES | CO MORBIDITY PRESENT | CLINICAL FINDING |
|---|---|---|---|---|---|---|---|---|
| 1 | SANTHAIYAH | NO | YES | 500 | YES | YES | RENAL FAILURE | CRACKLES |
| 2 | GANESAN | YES | YES | 375 | YES | YES | DIABETES | CRACKLES |
| 3 | CHINNAPAIYAN | NO | YES | 420 | YES | YES | COPD | DIMINISHED BREATH SOUND |
| 4 | GAJENDRAN | YES | YES | 300 | YES | NO | | CRACKLES |
| 5 | AROKIYA SAMY | YES | YES | 204 | YES | YES | COPD | CRACKLES |
| 6 | MOHANAPRIYA | NO | NO | | NO | NO | NO | CRACKLES |
| 7 | PANKAJAVALLI | NO | NO | | NO | YES | DIABETES | CRACKLES |
| 8 | CENSAPPAN | NO | NO | | NO | YES | ANAEMIA | DIMINISHED BREATH SOUND |
| 9 | SURESHKUMAR | NO | YES | 240 | YES | YES | HYPERTENSION DIABETES | CRACKLES |
| 10 | MADHAIYAN | YES | YES | 400 | NO | YES | DIABETES | CRACKLES |
| 11 | GOPAL | YES | YES | 260 | NO | NO | NO | CRACKLES |
| 12 | ELUMALAI | NO | NO | | NO | NO | NO | CRACKLES |
| 13 | ABDUL AZIZ | YES | NO | | YES | YES | DIABETES | CRACKLES |
| 14 | KANAGA | NO | NO | | NO | YES | ANAEMIA | CRACKLES |
| 15 | GOPINATHAN | NO | NO | | NO | NO | NO | CRACKLES |
| 16 | RAVI | NO | YES | 400 | YES | YES | DIABETES | CRACKLES |
| 17 | NEELAGANDAN | NO | YES | 330 | YES | YES | DIABETES | CRACKLES |
| 18 | EMMAROSE | YES | YES | 420 | YES | YES | GASTRIC ADENOCARCINOMA | CRACKLES |
| 19 | RAJENDRAN | NO | YES | 220 | YES | YES | DIABETES | CRACKLES |
| 20 | DHANAPAL | NO | NO | | YES | YES | DIABETES | CRACKLES |
| 21 | SIVAKUMAR | NO | NO | | NO | NO | NO | CRACKLES |
| 22 | DHANAM | YES | NO | | NO | YES | DIABETES | CRACKLES |
| 23 | GANESAN | NO | YES | 350 | YES | NO | NO | WHEEZE |
| 24 | RENUGA | NO | NO | | NO | YES | IDIOPATHIC THROMBOCYTOPENIA | CRACKLES |
| 25 | RAGAIAH | NO | YES | 300 | YES | YES | COPD | CRACKLES |
| 26 | SRINIVASAN | NO | NO | | NO | YES | TONSILLAR CARCINOMA | CRACKLES |
| 27 | KALIYAPERUMAL | NO | YES | 320 | YES | YES | DIABETES | CRACKLES |
| 28 | RAVICHANDRAN | YES | YES | 300 | YES | YES | ILD DIABETES | CRACKLES |
| 29 | ARAVINDASAMY | NO | NO | | NO | NO | NO | CRACKLES |
| 30 | PERUMAL | YES | YES | 350 | NO | YES | COPD | WHEEZE |

| ID | NAME | RADIOLOGICAL INVOLVEMENT | FOB FINDINGS | BAL GENE XPERT | IF DETECTED GENE XPERT RIFAMPICIN SENSITIVITY | BAL AFB | BAL C/S | BAL C/S IF YES |
|---|---|---|---|---|---|---|---|---|
| 1 | SANTHAIYAH | RIGHT UPPER LOBE | PURULENT SECRETIONS | MTB DETECTED | SENSITIVE | NEGATIVE | NOT CONTRIBUTORY | |
| 2 | GANESAN | RIGHT UPPER LOBE | PURULENT SECRETIONS | MTB NOT DETECTED | | NEGATIVE | CONTRIBUT ORY | PROTEUS MIRABILIS ESBL |
| 3 | CHINNAPAIYAN | LEFT UPPER LOBE | MUCOSAL INFLAMMATION | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 4 | GAJENDRAN | DIFFUSE INVOLVEMENT | MUCOSAL INFLAMMATION | MTB DETECTED | SENSITIVE | POSITIVE | NOT CONTRIBUTORY | |
| 5 | AROKIYA SAMY | RIGHT MIDDLE LOBE | BLOOD STAINED SECRETIONS | MTB DETECTED | SENSITIVE | NEGATIVE | NOT CONTRIBUTORY | |
| 6 | MOHANAPRIYA | LEFT UPPER LOBE | PURULENT SECRETIONS | MTB DETECTED | SENSITIVE | NEGATIVE | NOT CONTRIBUTORY | |
| 7 | PANKAJAVALLI | LINGULA | PURULENT SECRETIONS | MTB DETECTED | SENSITIVE | POSITIVE | NOT CONTRIBUTORY | |
| 8 | CENSAPPAN | RIGHT LOWER LOBE | INTRALUMINAL MASS | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 9 | SURESHKUMAR | LEFT UPPER LOBE | PURULENT SECRETIONS | MTB DETECTED | SENSITIVE | NEGATIVE | NOT CONTRIBUTORY | |
| 10 | MADHAIYAN | LEFT UPPER LOBE | PURULENT SECRETIONS | MTB DETECTED | SENSITIVE | POSITIVE | NOT CONTRIBUTORY | |
| 11 | GOPAL | RIGHT MIDDLE LOBE | MUCOUS PLUGGING | MTB DETECTED | SENSITIVE | POSITIVE | NOT CONTRIBUTORY | |
| 12 | ELUMALAI | LEFT UPPER LOBE | MUCOSAL INFLAMMATION | MTB DETECTED | SENSITIVE | NEGATIVE | NOT CONTRIBUTORY | |
| 13 | ABDUL AZIZ | LEFT UPPER LOBE | MUCOUS PLUGGING | MTB DETECTED | SENSITIVE | POSITIVE | NOT CONTRIBUTORY | |
| 14 | KANAGA | RIGHT UPPER LOBE | MUCOSAL INFLAMMATION | MTB DETECTED | SENSITIVE | NEGATIVE | NOT CONTRIBUTORY | |
| 15 | GOPINATHAN | DIFFUSE INVOLVEMENT | MUCOSAL INFLAMMATION | MTB DETECTED | SENSITIVE | NEGATIVE | NOT CONTRIBUTORY | |
| 16 | RAVI | LEFT UPPER LOBE | MUCOSAL INFLAMMATION | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 17 | NEELAGANDAN | DIFFUSE INVOLVEMENT | PURULENT SECRETIONS | MTB DETECTED | SENSITIVE | POSITIVE | NOT CONTRIBUTORY | |
| 18 | EMMAROSE | LEFT UPPER LOBE | MUCOSAL INFLAMMATION | MTB DETECTED | SENSITIVE | NEGATIVE | NOT CONTRIBUTORY | |
| 19 | RAJENDRAN | LEFT UPPER LOBE | PURULENT SECRETIONS | MTB DETECTED | SENSITIVE | POSITIVE | NOT CONTRIBUTORY | |
| 20 | DHANAPAL | LEFT LOWER LOBE | PURULENT SECRETIONS | MTB NOT DETECTED | | NEGATIVE | CONTRIBUTORY | NOCARDIA |
| 21 | SIVAKUMAR | DIFFUSE INVOLVEMENT | BLOOD STAINED SECRETIONS | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 22 | DHANAM | RIGHT LOWER LOBE | PURULENT SECRETIONS | MTB NOT DETECTED | | NEGATIVE | CONTRIBUTORY | PSEUDOMONAS |
| 23 | GANESAN | DIFFUSE INVOLVEMENT | MUCOSAL INFLAMMATION | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 24 | RENUGA | LEFT UPPER LOBE | PURULENT SECRETIONS | MTB DETECTED | SENSITIVE | POSITIVE | NOT CONTRIBUTORY | |
| 25 | RAGAIAH | RIGHT UPPER LOBE | PURULENT SECRETIONS | MTB NOT DETECTED | | NEGATIVE | CONTRIBUTORY | PROTEUSVULGARIS |
| 26 | SRINIVASAN | DIFFUSE INVOLVEMENT | MUCOSAL INFLAMMATION | MTB DETECTED | SENSITIVE | NEGATIVE | NOT CONTRIBUTORY | |
| 27 | KALIYAPERUMAL | LEFT LOWER LOBE | PURULENT SECRETIONS | MTB NOT DETECTED | | NEGATIVE | CONTRIBUTORY | E.COLI |
| 28 | RAVICHANDRAN | DIFFUSE INVOLVEMENT | PURULENT SECRETIONS | MTB DETECTED | SENSITIVE | POSITIVE | NOT CONTRIBUTORY | |
| 29 | ARAVINDASAMY | RIGHT LUNG | INTRALUMINAL MASS | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 30 | PERUMAL | DIFFUSE INVOLVEMENT | MUCOSAL INFLAMMATION | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |

| ID | NAME | BAL CYTOLOGY | BAL FUNGAL SMEAR | BAL CELL COUNT | ENDOBRONCHIAL BIOPSY DONE OR NOT | ENDOBRONCHIAL BIOPSY CONTRIBUTORY OR NOT | TBLB DONE OR NOT | IF DONE TBLB CONTIRIBUTORY OR NOT |
|---|---|---|---|---|---|---|---|---|
| 1 | SANTHAIYAH | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 2 | GANESAN | CHRONIC INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | NEUTROPHILIC | NOT DONE | | NOT DONE | |
| 3 | CHINNAPAIYAN | ATYPICAL CELLS SEEN | NOT CONTRIBUTORY | NEUTROPHILIC | NOT DONE | | NOT DONE | |
| 4 | GAJENDRAN | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 5 | AROKIYA SAMY | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 6 | MOHANAPRIYA | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 7 | PANKAJAVALLI | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 8 | CENSAPPAN | ATYPICAL CELLS SEEN | NOT CONTRIBUTORY | NEUTROPHILIC | DONE | CONTRIBUTORY | NOT DONE | |
| 9 | SURESHKUMAR | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 10 | MADHAIYAN | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 11 | GOPAL | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 12 | ELUMALAI | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 13 | ABDUL AZIZ | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 14 | KANAGA | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 15 | GOPINATHAN | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 16 | RAVI | CHRONIC INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | NEUTROPHILIC | NOT DONE | | NOT DONE | |
| 17 | NEELAGANDAN | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 18 | EMMAROSE | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 19 | RAJENDRAN | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 20 | DHANAPAL | CHRONIC INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | EOSINOPHILIC | NOT DONE | | NOT DONE | |
| 21 | SIVAKUMAR | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | MACROPHAGES(HEMOSIDERIN LADEN) | NOT DONE | | NOT DONE | |
| 22 | DHANAM | CHRONIC INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | NEUTROPHILIC | NOT DONE | | NOT DONE | |
| 23 | GANESAN | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | MACROPHAGE(PIGMENT LADEN) | NOT DONE | | NOT DONE | |
| 24 | RENUGA | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | NEUTROPHILIC | NOT DONE | | NOT DONE | |
| 25 | RAGAIAH | CHRONIC INFLAMMATORYPATHOLOGY | NOT CONTRIBUTORY | NEUTROPHILIC | NOT DONE | | NOT DONE | |
| 26 | SRINIVASAN | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | NEUTROPHILIC | NOT DONE | | NOT DONE | |
| 27 | KALIYAPERUMAL | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | NEUTROPHILIC | NOT DONE | | NOT DONE | |
| 28 | RAVICHANDRAN | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 29 | ARAVINDASAMY | ATYPICAL CELLS SEEN | NOT CONTRIBUTORY | NEUTROPHILIC | DONE | CONTRIBUTORY | NOT DONE | |
| 30 | PERUMAL | CHRONIC INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | MACROPHAGE(PIGMENT LADEN) | NOT DONE | | NOT DONE | |

| ID | NAME | TTNA DONE OR NOT | IF DONE TTNA CONTRIBUTORY OR NOT | CT GUIDED BIOPSY DONE OR NOT | CT GUIDED BIOPSY CONTRIBUTORY OR NOT | POST FOB AFB | POST FOB CYTOLOGY | ETIOLOGY DIAGNOSED OR NOT | DIAGNOSIS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | SANTHAIYAH | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 2 | GANESAN | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | BACTERIAL PNEUMONIA(PROTEUS) |
| 3 | CHINNAPAIYAN | DONE | CONTRIBUTORY | NOT DONE | | NOT CONTRIBUTORY | CONTRIBUTORY | YES | SQUAMOUS CELL CARCINOMA (POORLY DIFFERENTIATED) |
| 4 | GAJENDRAN | NOT DONE | | NOT DONE | | CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 5 | AROKIYA SAMY | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 6 | MOHANAPRIYA | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 7 | PANKAJAVALLI | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 8 | CENSAPPAN | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | CONTRIBUTORY | YES | SQUAMOUS CELL CARCINOMA (INFILTRATING) |
| 9 | SURESHKUMAR | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 10 | MADHAIYAN | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 11 | GOPAL | NOT DONE | | NOT DONE | | CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 12 | ELUMALAI | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 13 | ABDUL AZIZ | NOT DONE | | NOT DONE | | CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 14 | KANAGA | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 15 | GOPINATHAN | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 16 | RAVI | NOT DONE | | DONE | CONTRIBUTORY | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | SARCOMATOID CARCINOMA |
| 17 | NEELAGANDAN | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 18 | EMMAROSE | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 19 | RAJENDRAN | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 20 | DHANAPAL | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | BACTERIAL PNEUMONIA(NOCARDIA) |
| 21 | SIVAKUMAR | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | DAH WITH PULMONARY RENAL SYNDROME |
| 22 | DHANAM | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | BACTERIAL PNEUMONIA(PSEUDOMONAS) |
| 23 | GANESAN | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | SILICOSIS |
| 24 | RENUGA | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 25 | RAGAIAH | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | BACTERIAL PNEUMONIA(PROTEUS VULGARIS) |
| 26 | SRINIVASAN | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 27 | KALIYAPERUMAL | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | BACTERIAL PNEUMONIA(E.COLI) |
| 28 | RAVICHANDRAN | NOT DONE | | NOT DONE | | CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 29 | ARAVINDASAMY | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | CARCINOID TUMOR |
| 30 | PERUMAL | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | SILICOSIS |

| ID | NAME | AGE | GENDER | EDUCATION OF HEAD OF FAMILY | OCCUPATION OF HEAD OF FAMILY | GROSS TOTAL INCOME PER DAY | PRESENTING COMPLAINTS | DURATION IN WEEKS |
|---|---|---|---|---|---|---|---|---|
| 31 | KALIYARAJ | 47 | M | PRIMARY SCHOOL | FARMER | 275 | COUGH WITH EXPECTORATION | 10 |
| 32 | DURAISAMY | 54 | M | UNEDUCATED | FARMER | 200 | CHEST PAIN | 5 |
| 33 | PITCHAIKANNU | 49 | M | UNEDUCATED | COOLIE | 150 | COUGH WITH EXPECTORATION | 5 |
| 34 | MOORTHY | 31 | M | POSTGRADUATE DIPLOMA | SEMI PROFESSION | 1000 | COUGH | 5 |
| 35 | POOTHATHAN | 60 | M | UNEDUCATED | FARMER | 200 | COUGH WITH EXPECTORATION | 7 |
| 36 | SANTHAIYAH | 55 | M | UNEDUCATED | COOLIE | 250 | HEMOPTYSIS | 10 |
| 37 | SAIDA BANU | 22 | F | HIGHER SECONDARY | FARMER | 350 | DYSPNEA | 10 |
| 38 | PONNUSAMY | 60 | M | UNEDUCATED | COOLIE | 175 | DYSPNEA | 7 |
| 39 | RANJITH PASWAN | 40 | M | MIDDLE SCHOOL | COOLIE | 450 | COUGH WITH EXPECTORATION | 5 |
| 40 | ANJALAI | 24 | F | PRIMARY SCHOOL | COOLIE | 150 | HEMOPTYSIS | 5 |
| 41 | PERUMAL | 55 | M | UNEDUCATED | FARMER | 200 | COUGH WITH EXPECTORATION | 10 |
| 42 | BALAKRISHNAN | 53 | M | MIDDLE SCHOOL | FARMER | 250 | DYSPNEA | 10 |
| 43 | SEMBIAN | 60 | M | UNEDUCATED | COOLIE | 200 | COUGH | 5 |
| 44 | ZAIMUNISHA | 45 | F | HIGH SCHOOL | CLERICAL | 350 | COUGH WITH EXPECTORATION | 5 |
| 45 | JAYAKUMAR | 47 | M | MIDDLE SCHOOL | CLERICAL | 500 | HEMOPTYSIS | 5 |
| 46 | RAJESWARI | 57 | F | PRIMARY SCHOOL | COOLIE | 200 | COUGH WITH EXPECTORATION | 7 |
| 47 | RANGAN | 53 | M | UNEDUCATED | FARMER | 150 | COUGH WITH EXPECTORATION | 10 |
| 48 | SRINIVASAN | 51 | M | PRIMARY SCHOOL | FARMER | 200 | DYSPNEA | 10 |
| 49 | SHANKAR | 41 | M | UNEDUCATED | COOLIE | 250 | DYSPNEA | 10 |
| 50 | TAMILARASI | 40 | F | MIDDLE SCHOOL | COOLIE | 275 | DYSPNEA | 10 |
| 51 | GOVINASAMY | 53 | M | UNEDUCATED | FARMER | 450 | HEMOPTYSIS | 5 |
| 52 | NALLI | 60 | M | UNEDUCATED | FARMER | 150 | COUGH WITH EXPECTORATION | 10 |
| 53 | RAVI | 55 | M | UNEDUCATED | COOLIE | 200 | FEVER | 5 |
| 54 | RAAKAIAH | 40 | M | UNEDUCATED | FARMER | 250 | COUGH WITH EXPECTORATION | 10 |
| 55 | MALA | 43 | F | PRIMARY SCHOOL | CLERICAL | 500 | COUGH WITH EXPECTORATION | 7 |
| | | | | | | | | |

| ID | NAME | PREVIOUS H/O RESP ILLNESS | SMOKER | SMOKING INDEX | ALCOHOLISM | CO MORBIDITIES | CO MORBIDITY PRESENT | CLINICAL FINDING |
|---|---|---|---|---|---|---|---|---|
| 31 | KALIYARAJ | YES | YES | 300 | YES | YES | DIABETES | CRACKLES |
| 32 | DURAISAMY | NO | YES | 600 | YES | YES | COPD | CRACKLES |
| 33 | PITCHAIKANNU | NO | NO | | YES | NO | NO | CRACKLES |
| 34 | MOORTHY | NO | NO | | NO | YES | SLE | CRACKLES |
| 35 | POOTHATHAN | NO | NO | | YES | YES | DIABETES | CRACKLES |
| 36 | SANTHAIYAH | NO | YES | 350 | NO | YES | RENAL FAILURE | CRACKLES |
| 37 | SAIDA BANU | NO | NO | | NO | NO | NO | WHEEZE |
| 38 | PONNUSAMY | NO | NO | | YES | YES | RENAL FAILURE | WHEEZE |
| 39 | RANJITH PASWAN | NO | NO | | YES | NO | NO | CRACKLES |
| 40 | ANJALAI | NO | NO | | NO | YES | ANAEMIA | CRACKLES |
| 41 | PERUMAL | YES | YES | 450 | YES | YES | DIABETES | CRACKLES |
| 42 | BALAKRISHNAN | YES | NO | | NO | YES | ASTHMA | WHEEZE |
| 43 | SEMBIAN | NO | NO | | YES | NO | NO | DIMINISHED BREATH SOUND |
| 44 | ZAIMUNISHA | YES | NO | | NO | YES | RHEUMATOID ARTHRITIS | CRACKLES |
| 45 | JAYAKUMAR | NO | YES | 600 | YES | YES | COPD | CRACKLES |
| 46 | RAJESWARI | NO | NO | | NO | YES | DIABETES HYPERTENSION | CRACKLES |
| 47 | RANGAN | YES | YES | 550 | YES | YES | COPD | CRACKLES |
| 48 | SRINIVASAN | YES | NO | | YES | YES | HYPERTENSION | CRACKLES |
| 49 | SHANKAR | YES | NO | | NO | YES | ASTHMA | WHEEZE |
| 50 | TAMILARASI | YES | NO | | NO | NO | NO | WHEEZE |
| 51 | GOVINASAMY | NO | YES | 450 | YES | YES | COPD | CRACKLES |
| 52 | NALLI | YES | YES | 450 | YES | YES | DIABETES | CRACKLES |
| 53 | RAVI | NO | YES | 350 | YES | YES | COPD | CRACKLES |
| 54 | RAAKAIAH | NO | NO | | NO | NO | NO | WHEEZE |
| 55 | MALA | NO | NO | | NO | YES | DIABETES | CRACKLES |
| | | | | | | | | |

| ID | NAME | RADIOLOGICAL INVOLVEMENT | FOB FINDINGS | BAL GENE XPERT | IF DETECTED GENE XPERT RIFAMPICIN SENSITIVITY | BAL AFB | BAL C/S | BAL C/S IF YES |
|---|---|---|---|---|---|---|---|---|
| 31 | KALIYARAJ | RIGHT UPPER LOBE | PURULENT SECRETIONS | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 32 | DURAISAMY | RIGHT UPPER LOBE | INTRALUMINAL MASS | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 33 | PITCHAIKANNU | RIGHT UPPER LOBE | PURULENT SECRETIONS | MTB NOT DETECTED | | NEGATIVE | CONTRIBUTORY | KLEBSIELLA |
| 34 | MOORTHY | LEFT LOWER LOBE | MUCOSAL INFLAMMATION | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 35 | POOTHATHAN | LEFT LOWER LOBE | PURULENT SECRETIONS | MTB DETECTED | SENSITIVE | POSITIVE | NOT CONTRIBUTORY | |
| 36 | SANTHAIYAH | RIGHT UPPER LOBE | PURULENT SECRETIONS | MTB DETECTED | SENSITIVE | NEGATIVE | NOT CONTRIBUTORY | |
| 37 | SAIDA BANU | DIFFUSE INVOLVEMENT | MUCOSAL INFLAMMATION | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 38 | PONNUSAMY | DIFFUSE INVOLVEMENT | MUCOSAL INFLAMMATION | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 39 | RANJITH PASWAN | RIGHT MIDDLE LOBE | MUCOSAL INFLAMMATION | MTB NOT DETECTED | | NEGATIVE | CONTRIBUTORY | ACINETOBACTER |
| 40 | ANJALAI | LEFT UPPER LOBE | PURULENT SECRETIONS | MTB DETECTED | SENSITIVE | POSITIVE | NOT CONTRIBUTORY | |
| 41 | PERUMAL | LEFT LOWER LOBE | INTRALUMINAL GRANULATION TISSUE | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 42 | BALAKRISHNAN | RIGHT UPPER LOBE | MUCOSAL INFLAMMATION | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 43 | SEMBIAN | RIGHT UPPER LOBE | MUCOSAL INFLAMMATION | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 44 | ZAIMUNISHA | LEFT LOWER LOBE | PURULENT SECRETIONS | MTB DETECTED | SENSITIVE | POSITIVE | NOT CONTRIBUTORY | |
| 45 | JAYAKUMAR | LEFT LOWER LOBE | INTRALUMINAL MASS | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 46 | RAJESWARI | RIGHT MIDDLE LOBE | PURULENT SECRETIONS | MTB DETECTED | SENSITIVE | NEGATIVE | NOT CONTRIBUTORY | |
| 47 | RANGAN | LEFT UPPER LOBE | PURULENT SECRETIONS | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 48 | SRINIVASAN | DIFFUSE INVOLVEMENT | MUCOSAL INFLAMMATION | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 49 | SHANKAR | RIGHT LOWER LOBE | MUCOSAL INFLAMMATION | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 50 | TAMILARASI | DIFFUSE INVOLVEMENT | MUCOSAL INFLAMMATION | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 51 | GOVINASAMY | RIGHT LOWER LOBE | INTRALUMINAL MASS | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 52 | NALLI | RIGHT LOWER LOBE | PURULENT SECRETIONS | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 53 | RAVI | LEFT UPPER LOBE | PURULENT SECRETIONS | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 54 | RAAKAIAH | RIGHT LOWER LOBE | MUCOSAL INFLAMMATION | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| 55 | MALA | RIGHT UPPER LOBE | MUCOSAL INFLAMMATION | MTB NOT DETECTED | | NEGATIVE | NOT CONTRIBUTORY | |
| | | | | | | | | |

| ID | NAME | BAL CYTOLOGY | BAL FUNGAL SMEAR | BAL CELL COUNT | ENDOBRONCHIAL BIOPSY DONE OR NOT | ENDOBRONCHIAL BIOPSY CONTRIBUTORY OR NOT | TBLB DONE OR NOT | IF DONE TBLB CONTIRIBUTORY OR NOT |
|---|---|---|---|---|---|---|---|---|
| 31 | KALIYARAJ | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | NEUTROPHILIC | NOT DONE | | DONE | CONTRIBUTORY |
| 32 | DURAISAMY | ATYPICAL CELLS SEEN | NOT CONTRIBUTORY | LYMPHOCYTIC | DONE | CONTRIBUTORY | NOT DONE | |
| 33 | PITCHAIKANNU | CHRONIC INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | NEUTROPHILIC | NOT DONE | | NOT DONE | |
| 34 | MOORTHY | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | NEUTROPHILIC | NOT DONE | | NOT DONE | |
| 35 | POOTHATHAN | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 36 | SANTHAIYAH | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 37 | SAIDA BANU | CHRONIC INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 38 | PONNUSAMY | CHRONIC INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | DONE | CONTRIBUTORY |
| 39 | RANJITH PASWAN | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | NEUTROPHILIC | NOT DONE | | NOT DONE | |
| 40 | ANJALAI | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 41 | PERUMAL | CHRONIC INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | EOSINOPHILIC | DONE | CONTRIBUTORY | NOT DONE | |
| 42 | BALAKRISHNAN | CHRONIC INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | EOSINOPHILIC | NOT DONE | | NOT DONE | |
| 43 | SEMBIAN | ATYPICAL CELLS SEEN | NOT CONTRIBUTORY | NEUTROPHILIC | NOT DONE | | NOT DONE | |
| 44 | ZAIMUNISHA | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 45 | JAYAKUMAR | ATYPICAL CELLS SEEN | NOT CONTRIBUTORY | NEUTROPHILIC | DONE | CONTRIBUTORY | NOT DONE | |
| 46 | RAJESWARI | CHRONIC INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 47 | RANGAN | CHRONIC INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | MACROPHAGE | NOT DONE | | NOT DONE | |
| 48 | SRINIVASAN | CHRONIC INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | DONE | CONTRIBUTORY |
| 49 | SHANKAR | CHRONIC INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | EOSINOPHILIC | NOT DONE | | NOT DONE | |
| 50 | TAMILARASI | CHRONIC INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | MACROPHAGE(PIGMENT LADEN) | NOT DONE | | NOT DONE | |
| 51 | GOVINASAMY | ATYPICAL CELLS SEEN | NOT CONTRIBUTORY | NEUTROPHILIC | DONE | CONTRIBUTORY | NOT DONE | |
| 52 | NALLI | CHRONIC INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 53 | RAVI | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | LYMPHOCYTIC | NOT DONE | | NOT DONE | |
| 54 | RAAKAIAH | ACUTE INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | NEUTROPHILIC | NOT DONE | | NOT DONE | |
| 55 | MALA | CHRONIC INFLAMMATORY PATHOLOGY | NOT CONTRIBUTORY | NEUTROPHILIC | NOT DONE | | NOT DONE | |
| | | | | | | | | |

| ID | NAME | TTNA DONE OR NOT | IF DONE TTNA CONTRIBUTORY OR NOT | CT GUIDED BIOPSY DONE OR NOT | CT GUIDED BIOPSY CONTRIBUTORY OR NOT | POST FOB AFB | POST FOB CYTOLOGY | ETIOLOGY DIAGNOSED OR NOT | DIAGNOSIS |
|---|---|---|---|---|---|---|---|---|---|
| 31 | KALIYARAJ | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | BACTERIAL PNEUMONIA ACTINOMYCETES |
| 32 | DURAISAMY | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | CONTRIBUTORY | YES | SQUAMOUS CELL CARCINOMA (MODERATELY DIFFERENTIATED |
| 33 | PITCHAIKANNU | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | BACTERIAL PNEUMONIA(KLEBSIELLA) |
| 34 | MOORTHY | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | SLE PNEUMONITIS |
| 35 | POOTHATHAN | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 36 | SANTHAIYAH | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 37 | SAIDA BANU | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | CHRONIC HSP (BIRD FANCIERS LUNG) |
| 38 | PONNUSAMY | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | BOOP |
| 39 | RANJITH PASWAN | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | BACTERIAL PNEUMONIA |
| 40 | ANJALAI | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 41 | PERUMAL | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | FUNGAL PNEUMONIA (MUCOR) |
| 42 | BALAKRISHNAN | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | ABPA |
| 43 | SEMBIAN | NOT DONE | | DONE | CONTRIBUTORY | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | BRONCHOALVEOLAR CARCINOMA |
| 44 | ZAIMUNISHA | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 45 | JAYAKUMAR | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | SQUAMOUS CELL CARCINOMA (POORLY DIFFERENTIATED) |
| 46 | RAJESWARI | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | TUBERCULOSIS |
| 47 | RANGAN | NOT DONE | | DONE | CONTRIBUTORY | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | LIPOID PNEUMONIA |
| 48 | SRINIVASAN | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | CHRONIC HSP (FARMERS LUNG) |
| 49 | SHANKAR | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | ABPA |
| 50 | TAMILARASI | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | YES | SILICOSIS |
| 51 | GOVINASAMY | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | CONTRIBUTORY | YES | SMALL CELL CARCINOMA |
| 52 | NALLI | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | NO | UNDIAGNOSED |
| 53 | RAVI | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | NO | UNDIAGNOSED |
| 54 | RAAKAIAH | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | NO | UNDIAGNOSED |
| 55 | MALA | NOT DONE | | NOT DONE | | NOT CONTRIBUTORY | NOT CONTRIBUTORY | NO | UNDIAGNOSED |